Cruisers Owner's Manual

Model/Number: ______________________

Hull Identification Number: ______________________

Date of Purchase/First Use: ______________________

Dealer Name: ______________________

Address: ______________________

____

Phone Number: ______________________

Wellcraft®

WORLD CLASS BOATS ™

Catalog Requests Call 1-800-603-BOAT

For a complete list of standard and optional features and equipment, consult your local Wellcraft dealer. Due to a policy of continual product improvement, specifications are subject to change without notice. The weights and volumes shown are estimated and can vary from boat to boat because of equipment, etc. Wellcraft boats meet or exceed U.S. Coast Guard regulations at date of manufacture. Wellcraft is a trademark of Genmar Industries, Inc. Scarab is a registered trademark of Team Scarab, Inc.

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BOATS DESIGNED WITH NATURE IN MIND.

As privileged visitors to the world's oceans, lakes and waterways, we share an obligation to help protect our marine environment. Wellcraft is leading the way with a variety of unique systems designed to help minimize the impact of recreational boating.

Introduction

Congratulations on your new boat purchase and welcome to our boating family!

We want your boating experience to be the most enjoyable possible. The more you know about your new boat, the more you'll enjoy the time you spend aboard. That's why we prepared this manual. It's your guide for safe operation as well as understanding your boat's systems and equipment. It has been written for the beginning boater but experienced boaters will find helpful information as well. Be sure to read the contents thoroughly.

The popularity of boating and other water sports has grown tremendously in the past few years. Because of this, safety is an important issue for everyone who shares our waterways.

Remember that along with the freedom and exhilaration of boating comes the responsibility that you have for the safety of your passengers and the other boaters who share the water with you. Throughout this manual, specific precautions and symbols identify safety-related information. Be sure to pay close attention to them.

⚠ This symbol means "pay attention!" Here is important information for your safety. If you don't follow these instructions, you can damage your boat, hurt yourself or someone else or, even worse, have a fatal accident.

⚠ CAUTION

This symbol and signal word indicate a potentially hazardous situation. If you ignore this safety message, property damage or minor or moderate personal injury MAY or CAN result.

⚠ WARNING

This symbol and signal word indicate a potential hazard. If you ignore this safety message, serious injury or death CAN result.

⚠ DANGER

This symbol and signal word indicate an immediate hazard. If you ignore this safety message, serious personal injury or death WILL result.

Due to our policy of continuous product improvement, the illustrations used in this manual may not be identical to the components, controls, gauges, etc. on your boat, as they are intended to be representative reference views. Some controls, indicators or information may be optional and not included on your craft.

The precautions in this manual can't and don't cover every boating situation. If a specific method or procedure is not recommended, you must make sure that what you do is safe for you and others. Always use common sense when boating! Remember too that every safe boating excursion is a happy experience.

We'd also like to remind you to be kind to our environment while you're boating. Don't throw garbage and other refuse overboard. And do your best to keep harmful compounds like gasoline and antifreeze out of the water.

This manual has been compiled to help you operate your craft with safety and pleasure. It contains the details of the craft, the equipment supplied or fitted, its systems, and information on its operation and maintenance. Please read it carefully and familiarize yourself with the craft before using it.

If this is your first craft, or if you are changing to a type of craft you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before "assuming command" of the craft. Your dealer or national sailing federation or yacht club will be pleased to advise you of local sea schools and competent instructors.

PLEASE KEEP THIS MANUAL IN A SECURE PLACE, AND HAND IT OVER TO THE NEW OWNER WHEN YOU SELL THE CRAFT.

Table of Contents

General Information – 1

This manual has been compiled to help you to operate your boat with safety and pleasure. It contains details of the vessel, the equipment supplied or fitted, its systems and information on its operation and maintenance. Please read it carefully, and familiarize yourself with the boat before using it.

If this is your first boat or if you are changing to a type of boat you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operation experience before "assuming command" of the boat. Your dealer, or U.S. Coast Guard Auxiliary or yacht club will be pleased to advise you of local sea schools, or competent instructors.

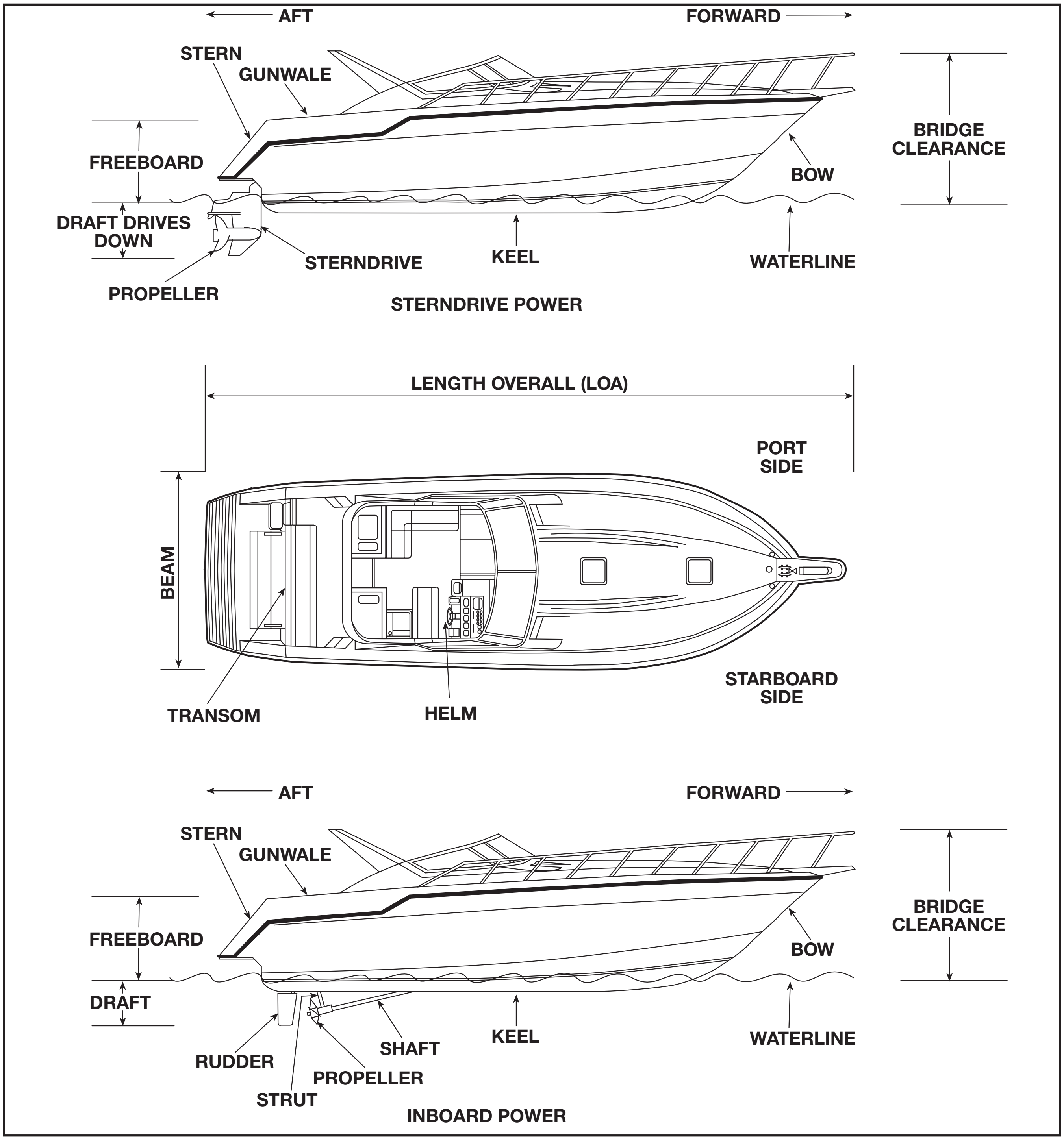


FIGURE 1.1 TERMINOLOGY

YOU AND YOUR NEW BOAT

Congratulations on your new boat and welcome to the Wellcraft family. We want you to receive the most enjoyment possible from your new boat, and the more you know about it, the easier that will be.

It is important that you take the time to read this entire manual prior to taking your boat out for the first time. Also read all literature supplied with your boat by the manufacturers of the various components and accessories which are used on your boat. In particular, you want to become familiar with operating your engine. This owner's manual does not supersede or change any of the original manufacturers' specifications, operation or maintenance instructions.

If you are new to boating, you may not be familiar with some common boating terms. **Figure 1.1** lists some of these terms and identifies their meaning in relation to a typical boat.

Review and train yourself and your family in safety, emergency and operating procedures. Pay close attention to all highlighted safety warnings, cautions and hazards, and remember that along with the freedom and fun of a powerboat, comes the responsibility for the safety of your passengers, other boaters and the environment which we all share. We recommend that you read the boating literature published by your state boating agency and the U.S. Coast Guard. Other suggested reading can be found later in this section.

Also, take the time to know your boat. Look it over, walk around in it, locate the different components, gauges, and operating equipment and figure out how to use them before you go out on the water. This familiarity allows for a much safer and smoother boating experience.

CONSTRUCTION STANDARDS/ CERTIFICATION

All our boats meet or exceed the construction standards set by the U.S. Coast Guard and the American Boat and Yacht Council (ABYC) concerning:

- Navigational lights
- Factory installed fuel systems
- Engine and fuel tank compartment ventilation
- Flotation
- Steering systems
- Backfire flame arresters

Most Wellcraft models have also been certified to carry the CE mark. The CE mark certifies that the boat meets relevant parts of the European Directive for Recreational Craft 94/25/EC of the

WARRANTY REGISTRATION CARD

RETURN THIS PORTION OF FORM TO MANUFACTURER

IMPORTANT: In order to validate your warranty and comply with the Federal law requiring boat manufacturers to keep a permanent record of owners' names and addresses, it is necessary that this card be completed, mailed and received <u>within 15 days</u> from date of purchase.

Owner's Name ______________________ **Telephone (** ___ **)** __________

Address ______________________________________

City ______________ **State/Province** ________ **Country** __________ **Zip** __________

Hull Serial Number

Year and Model

Engine(s)

I HAVE READ AND UNDERSTAND THE MANUFACTURER'S LIMITED WARRANTY AS IT APPEARS ON REVERSE SIDE OF THIS CARD.

DATE PURCHASED X OWNER'S SIGNATURE

European Parliament, including the International Organization for Standards (ISO) and Recreational Marine Agreement Group (RMAG) guidelines in effect at the time of manufacture.

We recommend that you see your dealer if you wish to modify factory–installed equipment or add new equipment. Your dealer is qualified to make such modifications or additions without placing the safety or design integrity of your boat at risk and without invalidating the warranty.

RESPONSIBILITIES

Boat Owner

1. Sign the warranty registration card including your address and the boat and hull serial numbers and mail it to us.

2. Inspect the boat at the time of delivery to verify that all systems and components are operating safely and acceptably. Read all manuals and instructions.

3. Operate all equipment in compliance with the manufacturer's instructions.

4. Review the pre-delivery checklist for the boat and engine with your dealer when you take delivery.

5. Schedule your 20-hour boat and engine checkup with your dealer.

6. Know your boat and the rules of the road before you use your boat.

IMPORTANT: Make sure that your dealer checks the engine alignment during your boat's 20-hour checkup. The engine alignment check should be performed in accordance with the recommended procedures as stated by the engine manufacturer in your engine owner's manual. Failure to do so could result in drive train damage which is not covered under the warranty.

7. We recommend that you reference your engine warranty certificate for initial inspection and service requirements.

8. Perform or provide for the scheduled maintenance checks outlined in this manual and all related service guides and manuals.

Along with boating, comes responsibility. Responsibility for safety, boating laws, and the environment. Please think about the future of our waterways, oceans and marine life while you're out enjoying them and take all necessary measures to help protect what natural habitats we have left. Keeping our waterways and marine habitats free from debris, and showing consideration for the creatures who thrive in these environments are some ways you can help assure the pleasure of boating for years to come.

The operator is also responsible for complying with the following procedures and operational requirements:

- State registration
- Insurance
- Warranty registration
- Warranty terms and conditions
- Rules of the road
- Break-in procedure
- Proper maintenance of the boat and its systems
- Safety equipment
- Safety training of passengers and crew
- Knowledge of boat systems
- Seaworthiness/operational inspection
- Safe operating practices
- Avoiding use of drugs/alcohol
- Environmental regulations
- Accident reports

Dealer

Your dealer will complete the pre-delivery checklist with you when you take delivery of your boat. A copy of the checklist is at the end of this section. Your dealer will also provide the following services:

1. Sign the checklist to certify that your boat is in top-notch condition and that all components are working properly.

2. Discuss the terms of all warranties and emphasize the importance of registering each warranty with the manufacturer.

3. Explain the proper procedures for obtaining warranty service.

4. If requested, provide you with comprehensive instruction in the operation of your boat and all its installed systems and components.

WARRANTY

The Limited Warranty, in its entirety, appears on the warranty registration card and is included at the end of this chapter. We have made every effort to simplify our warranty so that it may be easily understood. However, if you have any questions regarding the warranty please don't hesitate to contact us.

Wellcraft Marine Corp.
Attn: Customer Service
1651 Whitfield Avenue
Sarasota, FL 34243
Phone: (941) 753-7811

NOTE: There are items which are **not covered** by this warranty, including:

- Incidental and consequential damages (storage charges, telephone or rental charges of any type, inconvenience or loss of time or income.)
- Damage caused by neglect, lack of maintenance, accident, abnormal operation, improper installation or service.
- Haul-out, launch and towing charges.
- Transportation charges and/or travel time to and from a repair facility.
- Travel time to customer's home or marina.
- Service requested by customer other than that necessary to satisfy the warranty obligation.
- Oils, lubricants or fluids used in normal maintenance.
- Air freight, next-day or second-day air, or any special delivery fees unless pre-approved.
- Gelcoat cracking, yellowing, crazing or blistering, plexiglas, canvas, vinyl or tape **unless noted on equipment check off list** at time of delivery.
- Engines, drive trains, controls, props, batteries, or other equipment or accessories carrying their own individual warranties.
- It is important to note that on many of the components in our boats, i.e. stoves, refrigerators, generators, trim tabs, etc., the warranties are extended by the component manufacturer. (Most component manufacturers repair or replace the defective component if it is returned to them.) The customer is responsible for all travel time, freight, or postage costs. We will pay for the cost to remove and replace the component.
- Engines, parts or accessories not installed by Wellcraft Marine Corp.
- Plexiglas windscreen breakage, rainwater leakage through convertible tops, minor gelcoat discoloration, cracks, crazing, or air voids.
- Windshield and canvas top leakage: A certain amount of leakage can occur at the fasteners and at the stitching.
- Minor gelcoat discoloration or chalking may occur if regular washing and waxing has been neglected. Proper care of the gelcoat finish is the responsibility of the owner.
- Hull blisters that form below the waterline: Osmosis blistering is not covered by our limited warranty. The phenomenon is most likely to occur in warm, fresh water. However, it can also occur in saltwater. Any boat left in the water for any period of time is susceptible. Nearly all the marine bottom paint manufacturers today offer coatings that help protect the hull against osmosis blistering. **We highly recommend that you add a protective coating to your hull.**
- Normal deterioration, i.e. wear, tear, or corrosion of hardware, vinyl tops, vinyl and fabric upholstery, plastic, metal, wood, or trim tape.
- Hardware: Metal hardware that has rusted or pitted will not be replaced under warranty. You should keep this hardware clean and wiped down with a light oil (WD40).
- Vinyl tops: Wellcraft does not warrant damage that might occur when a boat is being towed on a trailer with the top up, and does not warrant shrinkage, mildew, or other normal deterioration.
- Any boat used for commercial purposes: This includes boats used for charter purposes or time-share.
- Any defect caused by failure of the customer to provide reasonable care and maintenance.

By signing the warranty registration card you, the new owner, indicate an understanding of the terms and conditions of the Limited Warranty. The warranty registration card should be properly completed by the dealer, signed by the new owner, and returned to us within fifteen (15) days after the original purchase in order to validate the warranty. Be sure to keep the Owner's Registration Card for your records.

All boat manufacturers are required by The Federal Boat Safety Act of 1971 to notify first time owners in the event any defect is discovered "which creates a substantial risk of personal injury to the public." In order for us to comply with that law, if it becomes necessary, it is essential that your warranty registration card with the owner's name, address, and boat serial number be completed and mailed to Wellcraft Marine, 1651 Whitfield Ave., Sarasota, Florida 34243.

The limited warranty for your boat is transferable and can be extended to the next purchaser for the remainder of the warranty period by notifying Wellcraft Marine in writing within 15 days of the transfer, by using the warranty registration transfer form found at the end of this chapter. The transfer request must be accompanied by a copy of the title/registration and the transfer fee as determined by the boat length overall:

BOAT LENGTH OVERALL	TRANSFER FEE
Up to 21'	$200.00
Over 21' to 26'	$300.00
Over 26'	$500.00

WARRANTY SERVICE

As the owner, you are responsible for the proper registration of your boat at the time of purchase. You must also follow proper operation procedures and adhere to the care and maintenance procedures set forth in this manual. Be sure to read your boat's warranty, as well as the information and warranties (provided in your owner's portfolio) for major components. You are responsible for notifying your dealer in writing of any claimed defect within a reasonable period of time and returning your boat to your dealer for service.

Your dealer has been carefully selected to assist you with your sales and service needs. Your dealer will be glad to answer any of your questions about your new boat. The dealer has a direct interest in you as a customer and wants to see that you are completely satisfied with your purchase. The dealer is in the best position to help you and has full support and assistance from Wellcraft Marine.

If, for any reason, you are dissatisfied with the services performed by your dealer, we suggest that you discuss the matter with the service manager. The service manager is responsible for the quality of service being performed and has a direct interest in your satisfaction. If the matter is complicated and cannot be resolved to your satisfaction by the service manager, we suggest that you talk to the general manager or owner. In most cases a compromise can be reached.

If the matter cannot be resolved by the dealership to your satisfaction, contact the Wellcraft Marine Customer Service Department by calling (941) 753-7811 or by writing to:

Wellcraft Marine Corp.
Customer Service Department
1651 Whitfield Avenue
Sarasota, FL 34243

Have the following information available:

- HIN (hull identification number)
- Selling dealer's name and location
- Date of purchase
- Servicing dealer (if different from selling dealer)
- Nature of problem
- Names of dealership personnel involved with the situation
- Record of service performed and approximate dates

When contacting Wellcraft Marine, keep in mind that your problem will most likely be resolved at the dealership, using the dealership's facilities, equipment, and personnel.

OWNER'S PORTFOLIO

Some manufacturers of components such as the engine and AM/FM stereo cassette supply their own instruction manuals which are included in your water-resistant "Owner's Portfolio." The information in the component instruction manuals may be different from the information in this manual because of product improvements. If you notice a discrepancy, ALWAYS FOLLOW THE INSTRUCTIONS IN THE SUPPLIER'S MANUAL. Additionally, the suppliers of these products maintain their own manufacturer's warranty and service facilities. To register your ownership, fill out and mail each

warranty card. Use your Owner's Portfolio to retain instructions and data on additional equipment or accessories installed after delivery.

IMPORTANT: Operation, maintenance and safety information is outlined by the manufacturer of most installed equipment. Properly operating and maintaining the equipment on your boat will help you to enjoy many years of SAFE boating.

OWNER'S LOGS AND RECORDS

At the end of this section are several forms which you will find very helpful.

Use the **Boat Data Record** to record all important information about your boats and the major components installed. After you have entered all the data, remove this form from your Owner's Manual and store in a safe place. **Do not** keep this form aboard your boat.

The **Float Plan** provides a record of your destination, departure and return times, boat description, passenger list, and other information about the trip you have planned. At the bottom of the form is space for listing emergency telephone numbers in case your return is delayed past the expected time. It also has space for indicating information about the person filing this report. Leave the completed form ashore with a responsible person. We recommend you make several copies of this form each boating season to assure an ample supply.

The **Fuel Log** is a handy way to record information covering engine hours, fuel on board, and range as well as engine speed, travel speed and fuel consumption.

The **Service/Maintenance Log** provides a record of maintenance work completed on your boat, the date of completion and the engine hour reading. This log will also help you identify the frequency of routine maintenance work, such as engine oil changes. If you should decide to sell your boat, it will demonstrate to prospective buyers that you have done a good job of taking care of your boat.

BOATING LAWS AND REGULATIONS

The U.S. Coast Guard is the authority of the waterways; they are there to help the boating public. State boating regulations are enforced by local authorities. You are subject to marine traffic laws and "Rules of the Road" for both federal and state waterways; you must stop if signaled to do so by enforcement officers, and permit to be boarded if asked.

There are many pamphlets, prepared by the Coast Guard, available to you. These pamphlets explain "Rules of the Road," signal lights, buoys, safety, international and inland regulations and other information which goes beyond the scope of this manual. For more information contact your local U.S. Coast Guard Unit or call the Coast Guard Boating Safety Hotline at 1-800-368-5647.

BOAT OWNER REGISTRATION

Federal and state laws require that every boat equipped with propulsion machinery of any type must be registered in the primary state of usage. Registration numbers and validation stickers must be displayed on the boat according to regulations. In most states, this means registration with the designated state agency. In a few jurisdictions, the Coast Guard retains registration authority. Your dealer will either supply registration forms or tell you where they may be obtained. The registration agency will issue you a certificate that must be carried on board when the boat is in use. Some states require additional registration when an out of state boat is used within their boundaries.

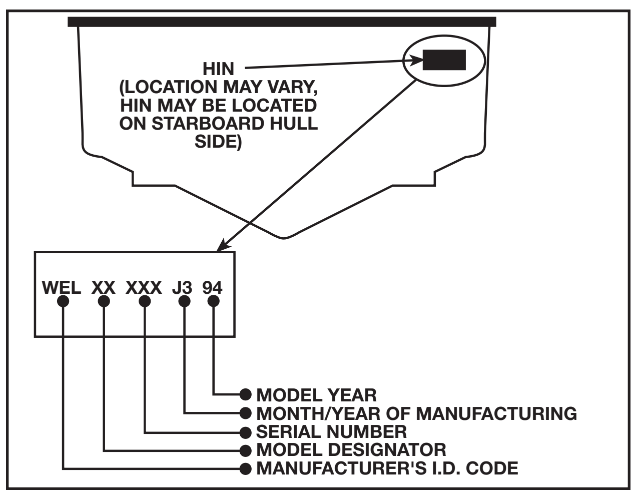


FIGURE 1.2 HIN

Your boat has a hull identification number on the starboard side of the hull. **Figure 1.2** shows

a typical identification number. Use this hull identification number for registration and to identify your boat for warranty service.

INSURANCE

In most states, the boat owner is legally responsible for damages or injuries he or she causes, even if someone else is operating the boat at the time of the accident. Common sense dictates that you carry adequate personal liability and property damage insurance on your boat, just as you would on an automobile. You should also protect your investment by insuring your boat against physical damage or theft.

ACCIDENT REPORTING

The operator of the boat is responsible for filing a report with the appropriate authorities. In general, reports are necessary for accidents involving loss of life, injury, or damage over $500. In the case of accidents with reportable injuries or death, a formal report is required within 48 hours. If only property damage is involved, a report must be made within ten days. The 1994 Recreational Boating Act may impose a $1,000 civil fine for people who fail to submit a boating accident report. Ask your insurance agent for more information.

If you see a distress signal, you must assume it is a real emergency and render assistance immediately. The master or person in charge of a boat is obligated by law to provide assistance to any individual in danger at sea. However, you should not put your boat or crew in a dangerous situation which exceeds your capabilities or those of your boat. The 1971 Boating Safety Act grants protection to a Good Samaritan boater offering good faith assistance, and absolves a boater from any civil liability arising from assistance given.

DISCHARGE OF OIL

The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon or a discoloration of the surface of the water or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of $5,000.

DISPOSAL OF PLASTICS & OTHER GARBAGE

Plastic refuse dumped in the water can kill fish and marine wildlife and can foul boat propellers and cooling water intakes. Other forms of waterborne garbage can litter our beaches and make people sick. U.S. Coast Guard regulations prohibit the dumping of plastic refuse or other garbage mixed with plastic into the water anywhere, and restrict the dumping of other forms of garbage within specified distances from shore.

MARPOL TREATY

Boats 26 feet or longer must display a sign stating the disposal regulations of the Federal Water Pollution Control Act. The U.S. Coast Guard has issued these regulations to implement Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, commonly known as Annex V of the MARPOL (Marine Pollution) Treaty 73/78. They apply to all U.S. boats wherever they operate (except waters under the exclusive jurisdiction of a State) and foreign boats operating in U.S. waters out to and including the Exclusive Economic Zone (200 miles). It is important to know these regulations and adhere to them.

The regulations require U.S. recreational boaters, if your boat is 26 feet or more in length, to affix one or more USCG Trash Dumping Restrictions placards to your boat. The placard warns against the discharge of plastic and other forms of garbage within the navigable waters of the United States and specify discharge restrictions beyond the territorial sea. (The territorial sea generally ends three nautical miles from the seashore.) In addition, the placard must contain the warning that a person who violates these requirements is liable to civil ($25,000) and criminal (imprisonment) penalties. The placard also must note that State and local regulations may further restrict the disposal of garbage.

Operators shall display one or more placards in a prominent location and in sufficient numbers so they can be observed and read by crew and passengers. These locations might include embarkation points, food service areas, galleys, garbage handling spaces and common deck spaces frequented by crew and passengers. We recommend that these placards be installed on all boats. The placards may be purchased from

local marinas, boat dealerships and marine equipment suppliers. A special placard is available for boats operating on the Great Lakes.

IMPORTANT: It is illegal to discharge waste from your marine sanitary device (toilet) into the water in most areas. It is your responsibility to be aware of and adhere to all local laws concerning waste discharge. Consult with the Coast Guard, local marina or your dealer for additional information.

NOTE: Some states and localities have legal limits on speed, noise and trailer specifications. It is your responsibility to be aware of these laws and limits and to insure that your boat (and trailer) comply. Consult with your local Marine Patrol or local Coast Guard office.

RECOMMENDED READING

Damford, Don. *Anchoring*.
(ISBN 0-915160-64-1). Seven Seas.

United States Coast Guard Auxiliary. *Boating Skills and Seamanship*. LC74-164688. (illus.). (ISBN 0-930028-00-7). U.S. Coast Guard.

Bottomley, Tom. *Boatman's Handbook*, (illus.). 316 p. pap. (ISBN 0-688-03925-1, Hearst Marine Bk.). Morrow.

Whiting, John and Bottomley, Tom. *Chapman's Log and Owner's Manual*. 192 p. (ISBN 0-87851-801-0); (ISBN 0-686-96737-2). Hearst Bks.

Strahm, Virgil. *Does Your Fiberglass Boat Need Repair?* LC81-90093. (illus.). 46 p. pap (ISBN 0-9606050-0-2). Strahm.

Chapman, Charles F. and Maloney. E.S. *Chapman's Piloting, Seamanship and Small Boat Handling*. (illus.) 62 p. (ISBN 0-87851-814-2, Pub. by Hearst Bks.); deluxe ed. (ISBN 0-87851-815-0). Morrow

National Fire Protection Association. *Fire Protection Standard for Pleasure and Commercial Motor Craft*. (ISBN 0-317-07388-5, NFPA 302). Natl. Fire Prot.

Brotherton, Miner. *Twelve-Volt Bible*. Plastic comb. (ISBN 0-915160-81-1). Seven Seas.

CONTACTS

Education programs are sponsored by publications and organizations such as the U.S. Power Squadron, U.S. Coast Guard Auxiliary and The American Red Cross. See your dealer about special courses available in your area. For detailed information contact:

American Red Cross (For local address consult the telephone directory).

Boat U.S. Foundation for Boating Safety Hotline
1-800-336-BOAT
1-800-245-BOAT (in Virginia)
Coast Guard Boating Safety Hotline
1-800-368-5647

Skippers Course
GPO Superintendent of Documents
Washington, DC 20012

United States Coast Guard Auxiliary
Local Flotilla or contact appropriate Coast Guard District Headquarters

United States Coast Guard Headquarters
202-512-1800
202-512-2250 (fax)

United States Power Squadron
P.O. Box 30423
Raleigh, NC 27617

WELLCRAFT MARINE CORPORATION LIMITED WARRANTY

Wellcraft Marine Corporation (“Wellcraft”), warrants to you, the first retail purchaser of this 2001 model year or later boat, that it will repair or replace defects in materials or workmanship that occur within the applicable warranty periods, subject to limitations set forth below. The applicable Warranty Period runs from the date the boat is delivered:

Defects in non-structural parts and components: One (1) year Warranty Period.

Defects in structural parts and components: Five (5) year Warranty Period.

Your sole and exclusive remedy is the repair or replacement, at Wellcraft’s sole option, of parts and components covered by this warranty.

This Wellcraft boat, including any alleged defective part, must be returned to an authorized Wellcraft dealer within the applicable warranty period to obtain warranty service. The Wellcraft dealer will carry out the warranty procedures on the owner’s behalf. All warranty work will be performed at an authorized dealer, at the Wellcraft factory, or at another repair facility that Wellcraft selects. The owner is responsible for the expense associated with transporting the boat to and from the repair facility.

An action for breach of warranty shall be barred unless it is commenced within four (4) years from the date the cause of action accrues. An action for breach of any duty or obligation to repair or replace shall be barred unless it is commenced within one year from the date the cause of action accrues regardless of the time remaining in the Warranty Period.

WHAT THIS WARRANTY DOES NOT COVER

A boat purchased from any party other than an authorized Wellcraft dealer.

A boat, including its components, that has been altered or modified so as to adversely affect its operation, performance or durability.

Engines, outdrives, controls, propellers, batteries, appliances and other equipment or accessories which are not manufactured by Wellcraft, whether or not warranted by other manufacturers.

Gelcoat finishes (including blistering and osmotic blistering, cracking, crazing or discoloration), mirrors, window glass, varnishes, paints, fabrics, chromium plated and stainless steel finishes, because of the varying effects resulting from different climatic and use conditions.

The cost of removal or re-instatement of parts or disassembly of units to repair or replace components covered by this warranty.

Any boat which has been misused, used in a negligent manner, used for racing, used for rental, charter, military or other commercial purposes, used without normal maintenance, operated contrary to any instruction furnished by Wellcraft, or operated in violation of any Federal, State, Coast Guard or other governmental agency laws, rules or regulations.

Any representation relating to speed, range, fuel consumption or other estimated performance characteristic.

Loss of time, inconvenience, boat payments, retail charges, improper lifting or trailering, travel expense, loss of use, in-and-out-of-water charges, towing and storage charges, loss of or damage to personal property, or other remedies not specifically allowed.

Dealer preparation, cleaning, final adjustments and alignments in preparing the boat for delivery or commissioning.

Leakage around windshield, hatches or other designed openings.

Fit and adjustment of exterior canvas tops, enclosures, and weather covers.

Sacrificial deterioration of anti-fouling paint or zinc anodes.

Remedy under this warranty is expressly limited to repair or replacement of defects in materials or workmanship, **and does not include incidental or consequential damages** which are specifically **DISCLAIMED**. Note: SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. The express limited warranty described above is exclusive. IMPLIED WARRANTIES (IF ANY), INCLUDING **MERCHANTABILITY** and **FITNESS FOR A PARTICULAR PURPOSE**, ARE LIMITED IN DURATION TO THE APPLICABLE WARRANTY PERIOD AND ARE EXPRESSLY DISCLAIMED AFTER EXPIRATION OF THE APPLICABLE WRITTEN WARRANTY PERIOD. There are no warranties which extend beyond the description on the face herof. **NOTE:** SOME STATES DO NOT ALLOW LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS WHICH VARY FROM STATE TO STATE.

This document contains the entire warranty given by Wellcraft. Wellcraft does not authorize any person or persons, including Wellcraft dealers, to change the terms of this express limited warranty, which is Wellcraft’s only warranty. Wellcraft reserves the right to change or improve the design or manufacture of Wellcraft boats without obligation to modify any boat previously manufactured.

PRE-DELIVERY CHECKLIST FOR: ______________ ______________

HULL SERIAL NUMBER — MODEL

☐ WELLCRAFT STERN DRIVE & OUTBOARD

BEFORE LAUNCHING:

- ☐ 1. Inspect all thru-hull fittings, tight and sealed
- ☐ 2. Connections to thru-hull fittings (interior)
- ☐ 3. Drain plugs installed (hull, engines, cooling system)
- ☐ 4. Drive unit(s) installed, oil level(s) checked
- ☐ 5. Check tie bar for alignment of twin engines
- ☐ 6. Install speedometer pitot tube
- ☐ 7. Steering (proper direction, full travel, tightness)
- ☐ 8. Propellers installed (R.H. stbd., L.H. port) check size
- ☐ 9. Gas vents clear
- ☐ 10. Bilge clean, limber holes open
- ☐ 11. Water hose test for leaks (windows, doors, hatches)

AFTER LAUNCHING:

- 12. Check for leaks
  - ☐ A. Thru-hull fittings
  - ☐ B. Sea-cocks (if applicable)
- 13. Electrical equipment operation
  - ☐ A. 12Vdc
  - ☐ B. 120Vac
- ☐ 14. Fuel system (check for leaks)
- ☐ 15. Steering action, free movement, no binding

BEFORE OPERATION OF ENGINES:

- ☐ 16. Wiring connections tight
- ☐ 17. Hose connections tight, no leaks
- ☐ 18. Throttle cable travel, tension
- ☐ 19. Open sea cocks
- ☐ 20. Check all fluid levels (engine(s)
- ☐ 21. Fuel shut-off valves open

Operate blower at least 5 minutes & check bilge for gas fumes

AFTER STARTING ENGINES:

- ☐ 22. Exhaust water flow
- ☐ 23. Fuel system leaks (gauges read correctly)
- ☐ 24. Cooling system leaks
- ☐ 25. Adjust idle speed (600-700 RPM in gear)
- ☐ 26. Shift thru gears (full travel) — must reach detents
- ☐ 27. All engine gauges function correctly
- ☐ 28. Fill out engine pre-delivery forms (if applicable)
- ☐ 29. Check ignition interrupter switches (if applicable)

WATER TEST:

- ☐ 30. Sgl./Stbd. Engine __________ RPM (top - trimmed)
- ☐ 31. Port engine __________ RPM (top - trimmed)
- ☐ 32. Steering control
- ☐ 33. Trim tab operation (if applicable)
- ☐ 34. Accessories (lights, wipers, pumps, etc.)

FINAL: ACCESSORIES

- ☐ 35. A/C pump
- ☐ 36. A/C compressor
- ☐ 37. Generator
- ☐ 38. Marine head, macerator pump & holding tank
- ☐ 39. Canvas
- ☐ 40. Converter (battery charger)
- ☐ 41. Appliances (stove, microwave, refrig., stereo, etc.)
- ☐ 42. Water (pressure) system/hot water tank
- ☐ 43. Bait well aerators (if applicable)
- ☐ 44. All manuals and warranties packed aboard

☐ WELLCRAFT INBOARD

BEFORE LAUNCHING

- ☐ 1. Inspect all thru-hull fittings, tight and sealed
- ☐ 2. Connections to thru-hull fittings (interior)
- ☐ 3. Drain plugs installed (hull, engines, cooling system)
- ☐ 4. Propellers installed (R.H. Stbd., L.H. port) check size
- ☐ 5. Propeller shafts turn free
- ☐ 6. Rudder Alignment, connection tight
- ☐ 7. Prop shaft aligned properly in shaft log
- ☐ 8. Strut properly aligned, shaft running squarely through cutlass bearing
- ☐ 9. Zincs installed
- ☐ 10. Gas vents clear
- ☐ 11. Bilge clean, limber holes open
- ☐ 12. Water hose test for leaks (windows, doors, hatches)

AFTER LAUNCHING:

- 13. Check for leaks
  - ☐ A. Thru-hull fittings
  - ☐ B. Sea-cocks (if applicable)
  - ☐ C. Prop shaft packing glands
  - ☐ D. Rudder shaft packing glands
- ☐ 14. Check propeller shaft coupling alignment (.003" max.)
- ☐ 15. Bend lock tabs on engine mounts
- ☐ 16. Electrical equipment operation
  - ☐ A. 12Vdc ☐ B. 120Vac ☐ C. 220Vac
- ☐ 17. Fuel system (check for leaks)
- ☐ 18. Steering action, free movement, no binding

BEFORE OPERATION OF ENGINES:

- ☐ 19. Wiring connections tight
- ☐ 20. Hose connections tight, no leaks
- ☐ 21. Coolant level (closed cooling system)
- ☐ 22. Throttle cable travel, tension
- ☐ 23. Transmission cable travel
- ☐ 24. Open sea cocks
- ☐ 25. Check all fluid levels (engine(s)

Operate blower at least 5 minutes & check bilge for gas fumes

AFTER STARTING ENGINES:

- ☐ 26. Exhaust water flow
- ☐ 27. Fuel system leaks (gauges read correctly)
- ☐ 28. Cooling system leaks
- ☐ 29. Engine water temperature (after warm-up)
- ☐ 30 Adjust idle speed (600-700 RPM in gear)
- ☐ 31. Shift thru gears (full travel — must reach detents)
- ☐ 32. All engine gauges function correctly
- ☐ 33. Fill out engine pre-delivery forms (if applicable)

WATER TEST:

- ☐ 34. Stbd. engine RPM __________ (top)
- ☐ 35. Port engine RPM __________ (top)
- ☐ 36. Steering control
- ☐ 37. Trim tab operation (if applicable)
- ☐ 38. Accessories (lights, wipers, pumps, etc.)
- ☐ 39. Re-Check shaft alignment after 72 hours in water (see 14 above)

FINAL: ACCESSORIES

- ☐ 40. A/C pump
- ☐ 41. A/C compressor
- ☐ 42. Generator
- ☐ 43. Canvas
- ☐ 44. Marine head, macerator pump and holding tank
- ☐ 45. Converter (battery charger)
- ☐ 46. Appliances (stove, microwave, refrig., stereo, etc.)
- ☐ 47. Water pressure system and hot water tank
- ☐ 48. All manuals and warranties packed aboard

PREDELCK/JW/0693

CUSTOMER DELIVERY: (To be filled in at time of delivery)

- ☐ Boat and engine(s) pre-delivery check list complete
- ☐ Operation and maintenance manuals provided
- ☐ Warranty(s) explained and form(s) completed
- ☐ Required Coast Guard equipment on board

Operation of equipment explained:

☐ Boat ☐ Engine(s)
☐ Accessories ☐ Trailer (if applicable)

Dealer Name: ______________________________

Account #: ______________________________

Dealer Signature ____________ Customer Signature ____________ Date: ________

Return to: WELLCRAFT (Warranty Department) 1651 Whitfield Avenue • Sarasota, FL 34243

SERVICE/MAINTENANCE LOG

DATE	HOUR METER READING	SERVICE/REPAIRS PERFORMED

BOAT DATA SHEET

Wellcraft Model Name ______________________ Hull Identification Number ______________________

Name of Boat __________________________________ State _________ Length ______ Beam __________

Hull Color(s) __________________________________ Weight ______

Draft (Drive Down) ________ Draft (Drive Up) ________ Freeboard (Forward) ________ (Aft) ________

Draft–Inboard ___________

Engine(s)

Make ________________ Model Name ________________ H.P. _____ Model No. _____________

Oil: SAE _____ Quarts per Engine _____ Oil Filter No. ______________

Port Serial No. ___________________________ Transom Plate Serial No. ______________________

Starboard Serial No. _______________________ Transom Plate Serial No. ______________________

Drive Unit(s)

Manufacturer ____________ Gear Ratio _______________ Model No. ________________________

Port Serial No. ___________ Starboard Serial No. __________________

Fuel Tank Capacity ______________ Number of Tanks ______ Fuel Filter No. ______________________

Water Tank Capacity ____________ Number of Tanks ______

Generator

Make __________________ Model Name ______________________ Model No. ________________

Serial No. _________________________________ K.W. _________________

Radio–VHF

Make ______________ Type ______ Model No. ______________ Serial No. ________________

Radio–Stereo

Make ______________ Type ______ Model No. ______________ Serial No. ________________

Battery Make _________________________________ Type _________________________

Propeller(s) Manufacturer ___________________________ Diameter/Pitch ___________/______________

No. of Blades ______ Style ___________ Material ____________ Mfg. Part No. _______________

Key Numbers Cabin ________________ Glove Box ______ Ignition Switch(s) _________ __________

Other Equipment

____

____

____

Selling Dealer

Name ________________________________

Address ______________________________

Phone No. ____________________________

Salesman _____________________________

Servicing Dealer

Name ___________________________________

Address _________________________________

Phone No. _______________________________

Service Manager __________________________

FUEL LOG

DATE	HOURS RUN	FUEL (GAL)	RANGE (MI)	RPM	MPH	GPH

FLOAT PLAN

Copy this page and fill out the copy before going boating. Leave the completed copy with a reliable person who can be depended upon to notify the Coast Guard, or other rescue organization, should you not return as scheduled. DO NOT file this plan with the Coast Guard.

Name ____________________ Telephone ____________________

Description of Boat: Type __________ Color __________ Trim __________

Registration Number ____________________

Length __________ Name __________ Make __________

Wellcraft Hull Identification Number ____________________

Other Info. ____________________

Persons Aboard: Name Age Address & Telephone

____

____

____

____

Engine Type: ____________________ HP ____________________

No. of Engines: ____________________ Fuel Capacity: ____________________

Survival Equipment:

PFDs __________ Flares __________ Mirror __________

Smoke Signals __________ Flashlight __________ Food __________

Paddles __________ Water __________ Anchor __________

Raft or Dinghy __________ EPIRB __________ Sea Anchor __________

Navigation Equipment

Compass __________ Loran __________ GPS __________ Radar __________

Radio: Yes _____ No _____ Type __________ Freq __________

Phone: Yes _____ No _____ Phone No. ____________________

Destination ____________________ Est. Time of Arrival ____________________

Expect to Return By ____________________

Auto Type __________ License No. __________ Where __________

If not returned by __________ call the Coast Guard, or ____________________.

(Local Marine Authority)

Coast Guard Telephone Number: ____________________

Local Marine Authority Telephone Number: ____________________

Wellcraft®
WORLD CLASS PERFORMANCE™

WELLCRAFT MARINE CORP., 1651 Whitfield Avenue, Sarasota, Florida 34243 Phone (941) 753-7811

WARRANTY REGISTRATION TRANSFER REQUEST

Original Owner Name & Address: ______________________________

____

____

Original Date of Purchase: ______________________________

Hull Identification Number: ______________________________

Boat Model: ______________________________

Selling Dealer: ______________________________

Name and address of new purchaser: ______________________________

____

____

Telephone Number: ______________________________

Date of Purchase: ______________________________

1995-1998 Model year transfer fee: $100.00 all models.

1999 Model year transfer fees:

16' - 21' Boats	$200.00
22' - 26' Boats	$300.00
27' and up Boats	$500.00

This transfer request must be accompanied by the applicable transfer fee and a copy of the new owner's title/registration. Warranty transfers must be received within 15 days of the subsequent purchase to be valid.

This warranty registration request, if accepted, transfers the warranty coverage remaining on the boat to the new purchaser. Acceptance of the request does not create any additional warranties or obligation on Wellcraft.

Warranty Expiration Date: ______________________________

Wellcraft Transfer Acceptance Date: ______________________________

Wellcraft Authorized Signature: ______________________________

Mail to Wellcraft Marine, 1651 Whitfield Ave., Sarasota, FL 34243, Attn: Customer Service Department.

WELLCRAFT MARINE CORP.

The popularity of boating and other water sports has undergone an explosion of growth in the past few years. Because of this, safety is an important issue for everyone who shares our waterways.

Your safety, the safety of your passengers and the safety of other boaters are among your responsibilities as operator of this boat. Your boat must be in compliance with U.S. Coast Guard safety equipment regulations. You should know how to react correctly to adverse weather conditions, have good navigation skills and follow the "Rules of the Road" as defined by the Coast Guard and state/county/local regulations.

Before each outing you should check all safety equipment such as bilge pumps, fire extinguishers, personal flotation devices, flares, distress flags, flashlights, ignition interrupter switch, etc. They should be operable, readily visible and easily accessible.

Complete a float plan and tell someone of your travel plans. Check local weather reports before casting off. Do not leave the dock area when strong winds and electric storms are in the area or predicted to be in the area. A sample float plan is at the end of Section 1.

ADVISORY STATEMENTS

Advisory statements forewarn conditions that affect equipment operation, maintenance and servicing practices, and they have two levels:

NOTE: Signals a general advisory statement that clarifies or highlights a particular section of text.

IMPORTANT: Used to signal the possibility of damage to equipment or associated components.

HAZARD COMMUNICATION

Safety is an important issue for everyone who shares in the use of our waterways. Throughout this manual, specific precautions and symbols identify safety related information.

⚠ The Safety Alert Symbol means pay attention! Your safety is involved. Not following the recommendations contained in any of these statements may result in property damage, personal injury or death.

⚠ CAUTION

This symbol and signal word indicate a potentially hazardous situation which, if not avoided, WILL or CAN cause minor or moderate personal injury or property damage if the warning is ignored.

⚠ WARNING

This symbol and signal word indicate a potentially hazardous situation which, if not avoided, CAN cause serious injury, death or substantial property damage if the warning is ignored.

⚠ DANGER

This symbol and signal word indicate an immediate hazard, which if not avoided, WILL result in serious personal injury or death.

The precautions listed in this manual are not all-inclusive. If a procedure, method, tool or part is not specifically recommended, you must satisfy yourself that it is safe for you and others and that your boat will not be damaged or made unsafe as a result of your decision. REMEMBER ALWAYS USE COMMON SENSE WHEN BOATING!

SAFE BOATING RECOMMENDATIONS

Boating safety and the safety of your passengers is YOUR responsibility. You should fully understand all of the following safety precautions before you launch your boat.

1. Never operate a boat while under the influence of drugs or alcohol. Doing so is a Federal offense. Make sure only qualified drivers operate your boat.

2. Keep your boat and its equipment in safe operating condition. Regularly inspect the hull, engine, safety equipment and all other boating gear.

3. Keep all lifesaving equipment including fire extinguisher in safe operating condition and in easily accessible locations. All passengers should know where this equipment is and how to use it.

4. Use extreme CAUTION while fueling your boat. Become familiar with the capacity of your boat's fuel tank and fuel consumption for commonly used RPMs. Avoid fueling at night except under well-lit conditions. Gas spills are hard to see in the dark.

⚠ WARNING

Each time you fill up, inspect fuel lines for leaks and hose deterioration, and be sure the engine compartment is free of gasoline vapors. Leaking fuel is a fire and explosion hazard and can cause severe injury or death. The use of alcohol modified fuels can cause deterioration of the fuel system.

5. Keep enough fuel on board for your planned cruising requirements as well as for changes in your plans due to adverse weather or other situations. We recommend the 1/3 rule: use 1/3 of your fuel to reach your destination, use 1/3 to return, and keep 1/3 in reserve.

6. Keep an eye on the weather. Be aware of possible changing conditions by monitoring local weather broadcasts prior to departure. The captain or first mate should personally monitor strong winds and electrical storms.

7. Always keep accurate up-to-date charts of your boating area on board.

8. Before departure file your Float Plan with a responsible person ashore.

9. Always operate your boat with consideration, courtesy and common sense.

10. At least one other passenger aboard should be indoctrinated on the basic operating procedures for handling your boat in the event you unexpectedly become unable to do so.

NOTE: The presence of the boat's maximum capacity plate does not override your responsibility to use common sense or rational judgment. The capacity of your boat is reduced by turbulent water and other adverse weather conditions. You should have prior knowledge of existing water and weather conditions before getting underway.

SAFETY EQUIPMENT

NOTE: As the owner of the boat, you are responsible for supplying a fire extinguisher approved by the U.S. Coast Guard and all other required safety equipment. Check state and local regulations and call the U.S. Coast Guard Boating Safety Hotline at 1-800-368-5647 for information about required safety equipment. You should also consider supplying additional equipment recommended for your safety and that of your passengers. A list of this equipment appears later in this section. Make yourself aware of its availability and its use.

PERSONAL FLOTATION DEVICES (PFDS)

You are required by Federal Regulations to have at least one Coast Guard approved personal flotation device (PFD) for each person in your boat. You may not use your recreational boat unless all your PFD's are in serviceable condition, are readily accessible, legibly marked with the Coast Guard approval number, and are of an appropriate size (within the weight range and chest size marked on the PFD) for each person on board. Your PFD provides buoyancy to help keep your head above the water and to help you remain in a satisfactory position while in the water. **Figures 2.1 through 2.5** show the five types of PFDs approved by the U.S. Coast Guard.

PFD Type I, Wearable, **(Figure 2.1)** has the greatest required buoyancy. Its design allows for turning most unconscious persons in the water from face down position to a vertical or slightly backward, face-up position. Type I is most effective for all waters, especially offshore when rescue may be delayed.

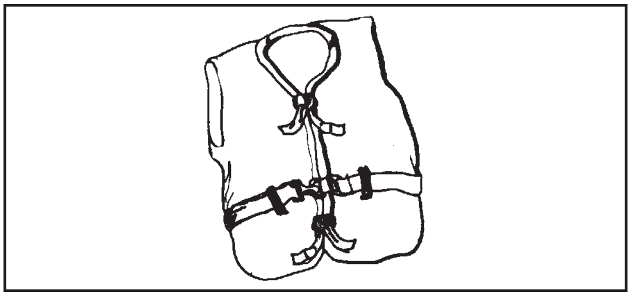


FIGURE 2.1 PFD TYPE I, WEARABLE

PFD Type II, Wearable, **(Figure 2.2)** turns its wearer in the same way as Type I, but not as effectively. The Type II will not turn as many persons under the same conditions as a Type I.

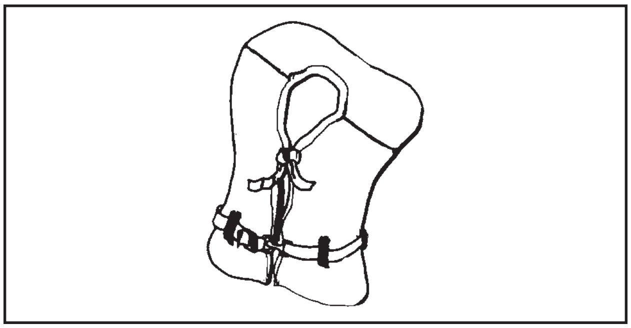


FIGURE 2.2 PFD TYPE II, WEARABLE

PFD Type III, Wearable, **(Figure 2.3)** allows the wearers to place themselves in a vertical or slightly backward position. It has the same buoyancy as a Type II PFD. It has little or no turning ability.

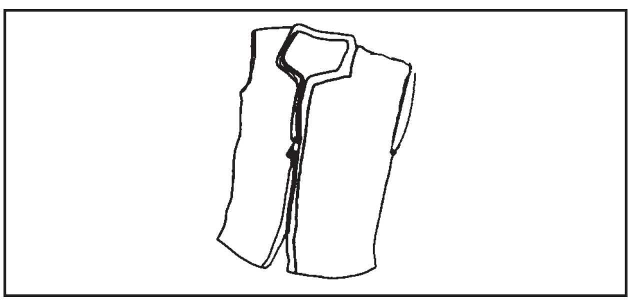


FIGURE 2.3 PFD TYPE III, WEARABLE

PFD Type IV, Throwable, **(Figure 2.4)** can be thrown to a person in the water, grasped and held by the user until rescued. The most common Type IV PFDs are a buoyant cushion or ring buoy. The throwable Type IV PFD should be immediately available for use and always in serviceable condition. This PFD is required in addition to the PFDs previously discussed.

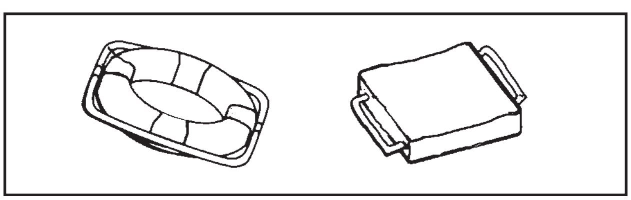


FIGURE 2.4 PFD TYPE IV, THROWABLE

PFD Type V, Wearable, **(Figure 2.5)** must be worn to be effective. When inflated, it provides buoyancy equivalent to Type I, II or III PFDs. When it is deflated, however, it may not support some people.

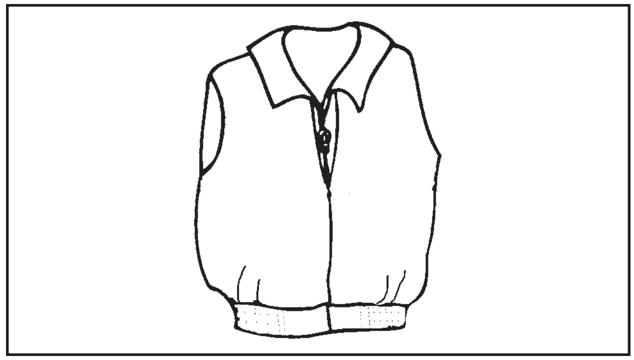


FIGURE 2.5 PFD TYPE V, WEARABLE

FIRE EXTINGUISHERS

All Class 1 (16 to 26 feet) powerboats are required to carry one (1) B-I type hand portable fire extinguisher unless the boat is equipped with a fixed fire extinguishing system in the engine compartment.

All Class 2 (26 to 39.4 feet) powerboats are required to carry two (2) approved B-I Extinguishers or one (1) approved B-II type hand portable fire extinguisher unless equipped with a fixed fire extinguishing system in the engine compartment. When equipped with a fixed fire extinguishing system, only one (1) B-I type hand portable fire extinguisher is required.

All Class 3 (40 to 65 feet) powerboats are required to carry three (3) approved B-I extinguishers or one (1) approved B-II and one (1)B-1 type hand portable fire extinguisher unless equipped with an approved fixed fire extinguishing system in the engine compartment. When equipped with an approved fixed fire extinguishing system, only two (2) B-I type hand portable fire extinguishers or one (1) B-II extinguishers are required.

All hand portable fire extinguishers should be mounted in a readily accessible location away from the engine compartment. All persons aboard should know the location and proper operation of the fire extinguisher(s).

If your fire extinguisher has a charge indicator

gauge, cold or hot weather may have an effect on the gauge reading. Consult the instruction manual supplied with the fire extinguisher to

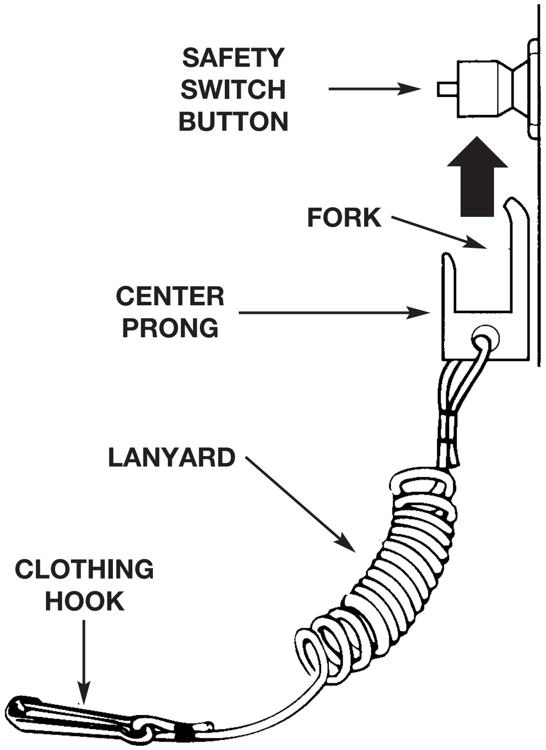


FIGURE 2.6 IGNITION INTERRUPTER WITH LANYARD

determine the accuracy of the gauge.

> ⚠ **WARNING**
>
> **The ignition interrupter switch must never be removed or modified and must always be kept free from obstructions that could interfere with its operation.**

IGNITION INTERRUPTER SWITCH WITH LANYARD

The ignition interrupter switch **(Figure 2.6)** is a safety device which automatically stops the engine when the operator falls from the control station. The ignition safety switch incorporates a shutoff switch, switch clip, lanyard and lanyard clip. The lanyard clip is securely attached to the operator's clothing, arm or leg. Be sure to attach the lanyard to a place where it is free of obstructions and to something that will move with the operator if he or she leaves the helm station.

In order for the engine to run, the lock plate on the end of the lanyard must be attached to the engine stop switch. To reset the switch after engine shutdown, reinstall the switch slip above the interrupter switch and flip the interrupter switch.

VISUAL DISTRESS SIGNAL DEVICES

Coast Guard approved visual distress signal devices are required on all recreational boats operating on coastal waters, (including the Great Lakes, territorial seas and those waters directly connected to the Great Lakes and the territorial seas)

Day Use Only

- Three orange smoke signals, one hand held and two floating **or**
- One orange flag with black square and disk

Night Use Only

- One S-O-S Electric distress light

Day and Night Use

- Three flares of the hand held, meteor or parachute type

No single signaling device is appropriate for all purposes. Consideration should be given to possessing various types of equipment. Careful selection and proper stowage of the equipment is very IMPORTANT if young children are frequently aboard.

NOTE: Regulations prohibit display of visual distress signals on the water under any circumstances except when assistance is required to prevent immediate or potential danger to persons on board a vessel.

SOUND SIGNALLING DEVICES

All Class 1 (16 to 26 feet) powerboats are required to carry a hand, mouth or power operated horn or whistle. It must produce a blast of two-second duration and audible at a distance of at least one-half (1/2) mile.

All Class 2 (26.1 to 39.4 feet) powerboats are required to carry a hand, mouth or power operated horn or whistle. It must produce a blast of two-second duration and audible at a distance of at least one (1) mile.

ADDITIONAL RECOMMENDED EQUIPMENT

The following list (not an exhaustive list) indicates some additional recommended equipment which should be considered for safe, enjoyable boating.

Tools

- Spark plug wrench
- Hammer
- Screwdrivers
- Jackknife
- Pliers
- Electricians tape
- Adjustable wrench
- Lubricating oil
- Prop wrench
- Duct tape

Spare Parts

- Extra Bulbs
- Spare Propeller
- Extra fuses
- Extra drain plug
- Spark plugs
- Spare wire
- Extra prop nut/washer

Basic Gear

- Flashlight
- Spare batteries
- Tow line
- Oar or paddle
- Mooring lines
- Compass
- Dock fenders
- Distress signals
- First aid kit
- Boat hook
- Foul weather gear
- VHF Radio
- EPIRB
- Suntan lotion
- Extra warm clothing
- Charts
- Second Anchor & line
- Ring life buoy with length of line attached
- Dewatering device (pump or bailer)
- Emergency supply of drinking water and food

SAFE BOATING COURSES

Your local U.S. Coast Guard Auxiliary and the U.S. Power Squadrons offer comprehensive safe boating classes several times a year. You may contact the Boat/U.S. Foundation at 1-800-336-BOAT (2628) or, in Virginia, 1-800-245-BOAT (2628) for a course schedule in your area. Also contact your local U.S. Coast Guard Auxiliary or Power Squadron Flotilla for the time and place of their next scheduled class.

⚠ **WARNING**

Alcohol consumption and boating do not mix. Operating any boat while intoxicated or under the influence of drugs is both dangerous and illegal. Impaired vision or judgment on the water can quickly lead to disaster. Driving any boat, requires sober, attentive care. Federal laws prohibit operating a boat under the influence of alcohol or drugs. These laws are vigorously enforced.

DRUGS AND ALCOHOL

The operator is responsible for the safety of all passengers. Refrain from the use of drugs and/or alcohol while operating your boat. Operation of motorized vessels while under the influence is a Federal offense carrying a significant penalty. The use of drugs and/or alcohol will decrease reaction time, impede judgment, impair vision and inhibit your ability to safely operate a boat.

SAFE OPERATION

Avoid product misuse including but not limited to the following actions:

- Riding seat back, gunwale, engine cover, bow or in other unsafe positions.

- Failure to use handholds or and other safety hardware.

- Overloading or improper handling.

- Excessive speeds for operating conditions or speeds exceeding the local limit. Allow enough distance to stop in an emergency. Observe “No Wake” warnings. The wake from your boat can jeopardize the safety of others.

- Use in weather or sea conditions beyond the skill or experience of the operator or the comfortable capability of the boat or passengers.

- Continued operation with operator's visibility blocked or impaired.

- Operating under the influence of drugs or alcohol.

POWER CAPACITY

Do not exceed the maximum engine power rating stated on the certification plate attached to your boat.

PASSENGER SAFETY

Be sure at least one of your passengers is familiar with the operation and safety aspects of the boat in case of an emergency. Show all passengers the location of emergency equipment and explain how to use it. Don't allow passengers to drag their feet or hands in the water or sit on the bow, deck, or gunwale while the boat is moving.

OPERATION BY MINORS

Minors should always be supervised by an adult whenever operating a boat. Many states have laws regarding the minimum age and licensing requirements of minors. Be sure to contact the state boating authorities for information.

⚠ WARNING

Carbon monoxide (CO) is an odorless and colorless gas. You cannot see it or smell it. Inhaling it for a short time can cause unconsciousness and brain damage. Prolonged exposure can kill!

Burning any material containing carbon produces carbon monoxide. A common source is the exhaust fumes from your boat's engines and generator. Other sources include fumes from open flame devices such as cooking ranges and charcoal grills.

Even with the best boat design and construction, CO may still accumulate in accommodation spaces under certain conditions. Continually observe passengers for symptoms of CO poisoning.

In high concentrations, CO can be fatal within minutes. In lower concentrations, its effects are cumulative and can be just as lethal over time. Watch for these are common symptoms of CO poisoning:

- Headaches
- Dizziness
- Itchy, watering eyes
- Incoherence
- Convulsions
- Drowsiness
- Fatigue
- Flushed appearance
- Ringing in the ears
- Physical collapse
- Nausea
- Vomiting
- Throbbing temples
- Difficulty breathing

If you observe any of the above symptoms, begin treatment immediately.

- Evacuate the area
- Move the victim to fresh air. Administer oxygen if available. Get medical help.
- Open all windows and hatches to ventilate the area.
- Investigate the source of CO and take immediate corrective action.

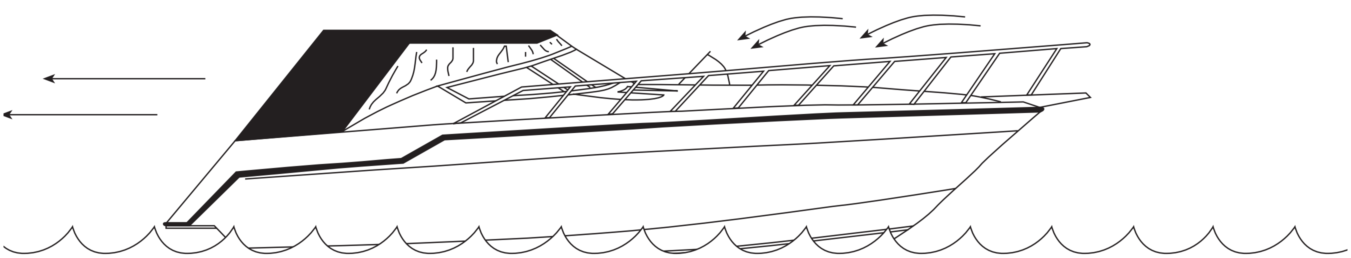
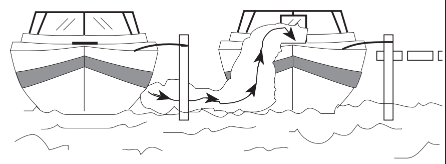
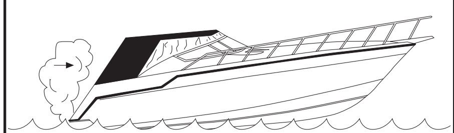
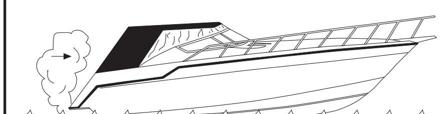
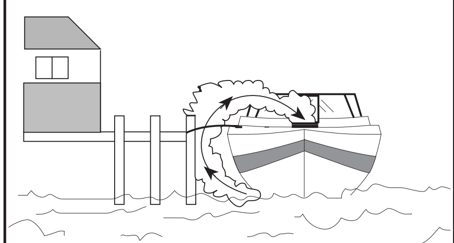
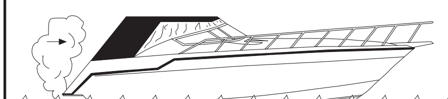


FIGURE 2.7 PROPER VENTILATION WHILE UNDERWAY

Prevention is the best solution!

- Make sure exhaust outlets are not blocked.
- Open hatches, doors, windows and vents to ensure adequate ventilation. **(Figure 2.7)**
- Make sure engine compartment doors and hatches are closed when engines or the generator is running.
- When docked or anchored, check for CO sources adjacent to your boat.
- Turn off the generator while you are sleeping.
- Have your dealer install a CO detector.
- Have your dealer inspect your exhaust systems whenever your boat is serviced. Make needed repairs immediately.
- Be alert to changes in engine sound caused by a leaking exhaust system.
- Continually observe passengers for symptoms of CO poisoning.

CARBON MONOXIDE ACCUMULATION

⚠ **DANGER** THESE CONDITIONS MAY CAUSE CARBON MONOXIDE TO ACCUMULATE.		**PRECAUTIONS** SEE INFORMATION ON CARBON MONOXIDE DETECTOR ON FOLLOWING PAGE
	Carbon monoxide in generator or hull exhaust from other vessels while docked or anchored can accumulate within the cabin and cockpit areas of your boat.	Be alert for generator and engine exhaust from other vessels alongside your boat.
	Under certain conditions, tail wind, boat speed, or high bow angle can direct carbon monoxide into your boat (backdrafting). CO can accumulate to dangerous levels without proper airflow.	Open hatches and doors to provide adequate ventilation, redistribute the load, or bring boat out of high bow angle.
	When you are using protective weather coverings, hull exhaust while underway can cause CO to accumulate in the cabin and cockpit areas.	Provide adequate ventilation when the canvas top, side curtains and/or back curtains are in their closed protective positions.
	When hull exhaust outlets are blocked by a pier, dock, seawall or any other means, CO can accumulate in the cockpit and cabin areas.	Make sure hull exhaust outlets are not blocked.
	CO in engine exhaust from your boat can accumulate within the cabin and cockpit areas when operating at slow speed or stopped in the water. Tail wind can increase accumulation.	Open windshield and cabin vents and remove any installed canvas to provide adequate air flow. Increase speed if possible.

CARBON MONOXIDE (CO) DETECTOR

We strongly recommend you have marine grade CO detectors installed in boats with canvas enclosures and in any boats with enclosed sleeping areas. Monitors are available from your dealer. Monitors should be professionally installed, calibrated, and tested.

NOTE: A CO detector is not a gas fuel vapor detector. Gas fuel vapor detectors do not monitor the buildup of carbon monoxide in an enclosed area.

WATER SPORTS

> ⚠ **WARNING**
>
> **Your boat is not designed for and should not be used for pulling parasails, kites, gliders or any device which can become airborne.**

Water skiing, kneeboarding or riding a towed, inflatable apparatus are some of the more popular water sports. Taking part in any water sport requires increased safety awareness by the participant and the boat operator. If you have never pulled someone behind your boat before, it is a good idea to spend some hours as an observer, working with and learning from an experienced driver. It is also important to be aware of the skill and experience of the person being pulled.

Everyone participating in a water sport should observe these guidelines:

1. Allow only capable swimmers to take part in any water sport.
2. Always wear a personal flotation device (PFD) approved by the U.S. Coast Guard. Wearing a properly designed PFD will help a stunned or unconscious person stay afloat.
3. Always participate in water sports in safe areas. Stay away from other boats, beaches, swimmers and heavily traveled waterways.
4. Be considerate to others you share the water with.
6. Give immediate attention to a person who has fallen. He or she is vulnerable in the water alone and may not be seen by other boaters.
7. Approach a person in the water from the lee side (opposite the direction of the wind). Stop the motor before coming close to the person.
8. Turn off engine and anchor your boat before swimming.
9. Swim only in areas designated as safe for swimming. These are usually marked with a swim area buoy **(Figure 2.8)**. Do not swim alone or at night.

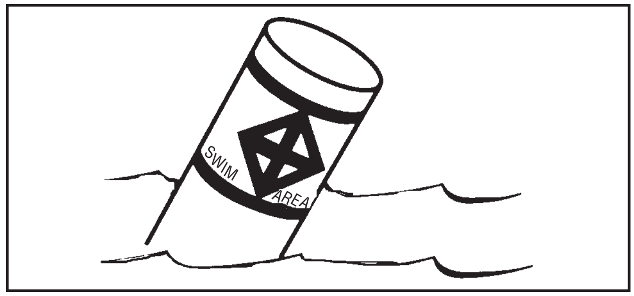


FIGURE 2.8 SWIM AREA BUOY

10. Do not allow anyone near the propeller(s), even when the engine is off. Propeller blades can be sharp and can continue to turn even after the engine if off. Stay at least 150 feet away from areas marked by a diver down float **(Figure 2.9)**.

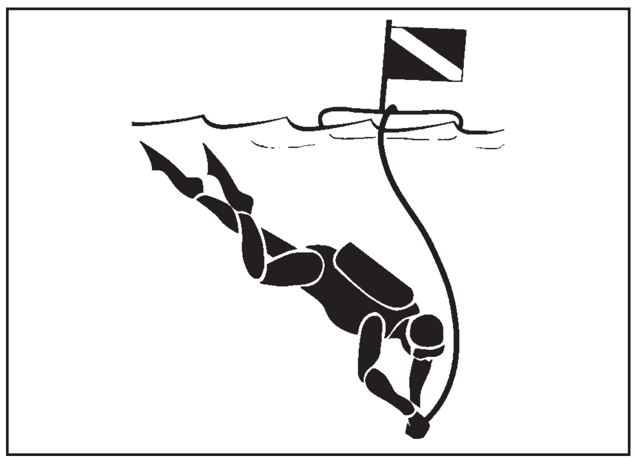


FIGURE 2.9 DIVER DOWN FLOAT

WATER SKIING

The popular sport of water skiing has brought a special set of safety precautions to observe in boating. The following guides, in addition to the guides listed above will do much to reduce the hazards while water skiing.

1. Water ski only in safe areas, away from other boats and swimmers, out of channels, and in water free of underwater obstructions.

2. Allow no one who cannot swim to water ski.

> **⚠ WARNING**
>
> **Skiers must wear a USCG approved personal flotation device. A Type III water-ski vest is an approved and practical PFD.**

3. Have a second person aboard to observe the skier and informer the driver about the skier's hand signals **(Figure 2.10)**. The driver must give full attention to operating the boat and the waters ahead.

4. Give immediate attention to a fallen skier. Be careful not to swamp the boat while taking a skier on board.

> **⚠ WARNING**
>
> **Switch engine off before taking skiers aboard from in the water. Do not leave engine running in neutral; if the shift is accidentally engaged the skier could be seriously injured by the propeller.**

5. Do not water ski between sunset and sunrise. It is illegal in most states.

6. For more information about water skiing, please contact the American Water Ski Association, 799 Overlook Drive, Winter Haven, FL 33884 (1-800-533-2972).

RULES OF THE ROAD

NOTE: The information in this section pertains only to navigation in the United States and its coastal waters. In other areas, the boat owner or captain is responsible for learning about navigation laws.

Your boat is subject to U.S. Coast Guard-enforced marine traffic laws known as "Rules of the Road." There are two sets of rules: the United States Inland Navigational Rules and the International Rules. The United States Inland Rules are applicable to all vessels inside the demarcation lines separating inland and international waters. The "Rules of the Road" can be obtained from your local U.S. Coast Guard Unit or the United States Coast Guard Headquarters by calling (202) 512-1800 or faxing your request to (202) 512-2250, and asking for the publication titled "Navigational Rules, International-Inland."

1. **Thumb Up:** Speed up the boat.
2. **Thumb Down:** Slow down the boat.
3. **Cut Motor/Stop:** Immediately stop boat. Slashing motion over neck (also used by driver or observer).
4. **Turn:** Turn the boat (also used by driver). Circle motion—arms overhead. Then point in desired direction.
5. **Return to Dock:** Pat on the head.
6. **OK:** Speed and boat path OK. Or, signals understood.
7. **I'm OK:** Skier OK after falling.

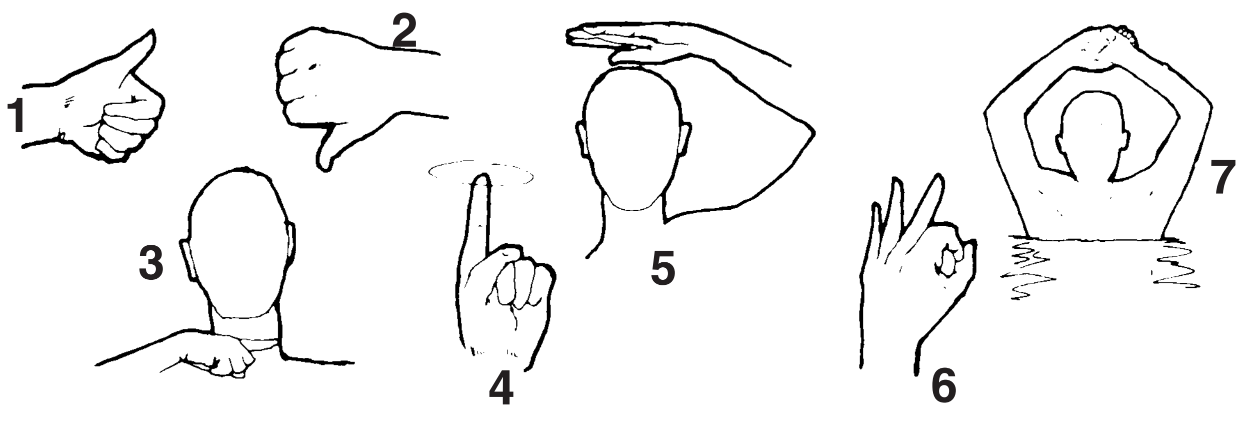


FIGURE 2.10 SKIER'S HAND SIGNALS

"Aids to Navigation" (U.S. Coast Guard pamphlet #123) explains the significance of various lights and buoys. This and other pamphlets, including the "Boating Safety Training Manual" and "Federal Requirements For Recreational Boats," are also available from the U.S. Coast Guard Headquarters.

Because of proposed alterations in buoys and markers, contact the U.S. Coast Guard to stay informed of changes.

The spoken word "MAYDAY" is the international signal of distress. MAYDAY should NEVER be used unless there is grave or imminent danger, and you are in need of immediate assistance.

AIDS TO NAVIGATION

Aids to navigation (ATONS) help you to travel safely on the water. They help you get from one place to another, and are most helpful if you have a nautical chart. NEVER tie your vessel to an ATON. It is illegal, and blocks it from view of other boaters, which can cause serious problems.

There are two ATON systems. The first system, used on federal waters, is known as the International Association of Lighthouse Authorities System B (IALA-B). The Coast Guard maintains this system. The second system is the Uniform State Waterway Marking System (USWMS). This system is maintained by state authorities.

IALA System B

In the United States, IALA-B uses four types of ATONS. These are lateral marks, safe water marks, special marks, and isolated danger marks. The Navigational Aids Chart at the end of this section reflects these aids.

Red, Right, Returning

Red, Right, Returning is a basic rule to assist you in using lateral markers. When you are returning from seaward, keep red markers on your starboard side when you pass them. These markers may either be buoys or fixed ATONS. Since lateral markers are either red or green, keep the green markers to your port (or left) side.

Returning from seaward is very clear if you have been on the ocean. You are returning to port. By agreement, going up a navigational river is returning from sea. The outlet ends of the Great Lakes are also the seaward ends. Also travelling from a large body of water to a smaller one is considered returning from seaward.

You are returning from seaward if you travel in a clockwise direction around the United States. So, going south on the Atlantic coast, north along the west coast of Florida, west along the Gulf coast, and north along the Pacific coast is returning from seaward.

Lateral Marks

Look at the left and right columns of the upper part of The Navigational Aids Chart. (The chart is at the end of this section.) These lateral marks indicate the sides of navigable channels. They consist of lighted buoys, CAN or NUN BUOYS, and DAYMARKS. Each has a number and is either red or green. The numbers on green markers are odd. Red markers have even numbers.

Buoys

Buoys are red or green floating ATONS. If lighted, they have either red or green lights. Unlighted green buoys, called cans, look like cylinders. Unlighted red nun buoys have cone shaped tops with their points cut off. Don't pass too close to a buoy. You may foul your propeller in its chain.

⚠ CAUTION

Buoys are anchored floating objects and may not always be exactly in the same position.

Daymarks

Daymarks are red or green boards with numbers. They are on posts or groups of pilings tied together and called dolphins. Daymarks and their supports are daybeacons. Daybeacons may or may not have lights. If a red or green daybeacon has a light, it is the same color as the marker red or green. Red daymarks are triangular and have even numbers. Green daymarks are square and have odd numbers.

Safe Water Marks

You can find Safe Water Markers at the center of the Navigational Aids Chart. These signals have vertical red and white stripes and mark the center of navigable channels and fairways. Safe water markers included both lighted and unlighted buoys and daymarks. If it is lighted, the light will be white, and will flash the letter A in Morse code.

Preferred Channel Markers

Preferred Channel Markers have horizontal red and green bands. If lighted, the color of the light is the same as the top of the band. They show the preferred channel for you to use at a junction point. Be sure to notice the color of the top band, and treat it as any other marker you would of that color. If the band is red and you are returning from seaward, keep the marker to your right.

Lights on Markers

Most lights on markers flash on and off. Others such as lights on aids with no lateral significance are fixed. They stay on all night. ATON lights flash in regular patterns. For example, they may flash every three seconds, or in groups such as two flashes and a pause. There are a number of flashing patterns, which help you identify the light at night. To identify a light, note its color and pattern or timing of flashes, and compare it to your chart to find its location.

THE UNIFORM STATE WATERWAY MARKING SYSTEM

There are four kinds of markers in the system Regulatory, Informational, Cardinal and Lateral.

USWMS Regulatory Markers

The markers in this system are either signs or buoys. Signs are square with orange borders. Regulatory buoys are white and shaped like cylinders. They have horizontal orange bands near their tops and just above the surface of the water.

An orange circle on a marker means a controlled area. A message such as No Wake, Idle Speed, No Skiing, or 5 MPH may appear on the marker.

An orange diamond means danger. If the diamond has an orange cross inside it, don’t enter the area. The reason you should stay out, such as “Swim Area” may be printed in black on the marker.

USWMS Informational Markers

USWMS informational markers are white signs with orange borders. They give information such as direction, distance, and location.

USWMS Lateral Markers

Lateral buoys in the USWMS system are either red or black. They have numbers, and black buoys may have green reflectors or lights. They are the equivalent of green buoys in the IALA-B system. Red buoys may have red reflectors or lights, as well. Red and black buoys are usually found in pairs pass between them.

A Special Sign

In Florida, you may see a special sign: “Caution, Manatee Area”. When you see this sign, slow down to idle speed. Manatees, an endangered species, are passive, large, slow-moving mammals. Many manatees are seriously injured or killed each year by boat propellers.

GENERAL RULES OF SEAMANSHIP

1. Cross waves at right angles.
2. When caught in heavy water or squalls, head either directly into the waves or at a slight angle. Reduce speed, but maintain enough power to maneuver your boat safely.
3. Keep your speed under control. Respect the rights of boaters engaged in fishing, swimming, water skiing or diving. Give them “wide berth”.
4. When meeting a boat head on, keep to the right whenever possible.
5. When two boats cross, the boat to the right or starboard has the right of way.
6. When overtaking or passing, the boat being passed has the right of way. The boat being passed is required to maintain the same course and speed.

RIGHT-OF-WAY

In general, boats with less maneuverability have right-of-way over more agile craft. In your power boat, you must stay out of the way of the following vessels:

- A vessel not under command or aground. Due to their circumstances, these vessels have no maneuverability.
- A vessel restricted in its maneuverability. These vessels are performing work which limits their maneuverability such as: surveying, dredging, laying pipe or cable, or

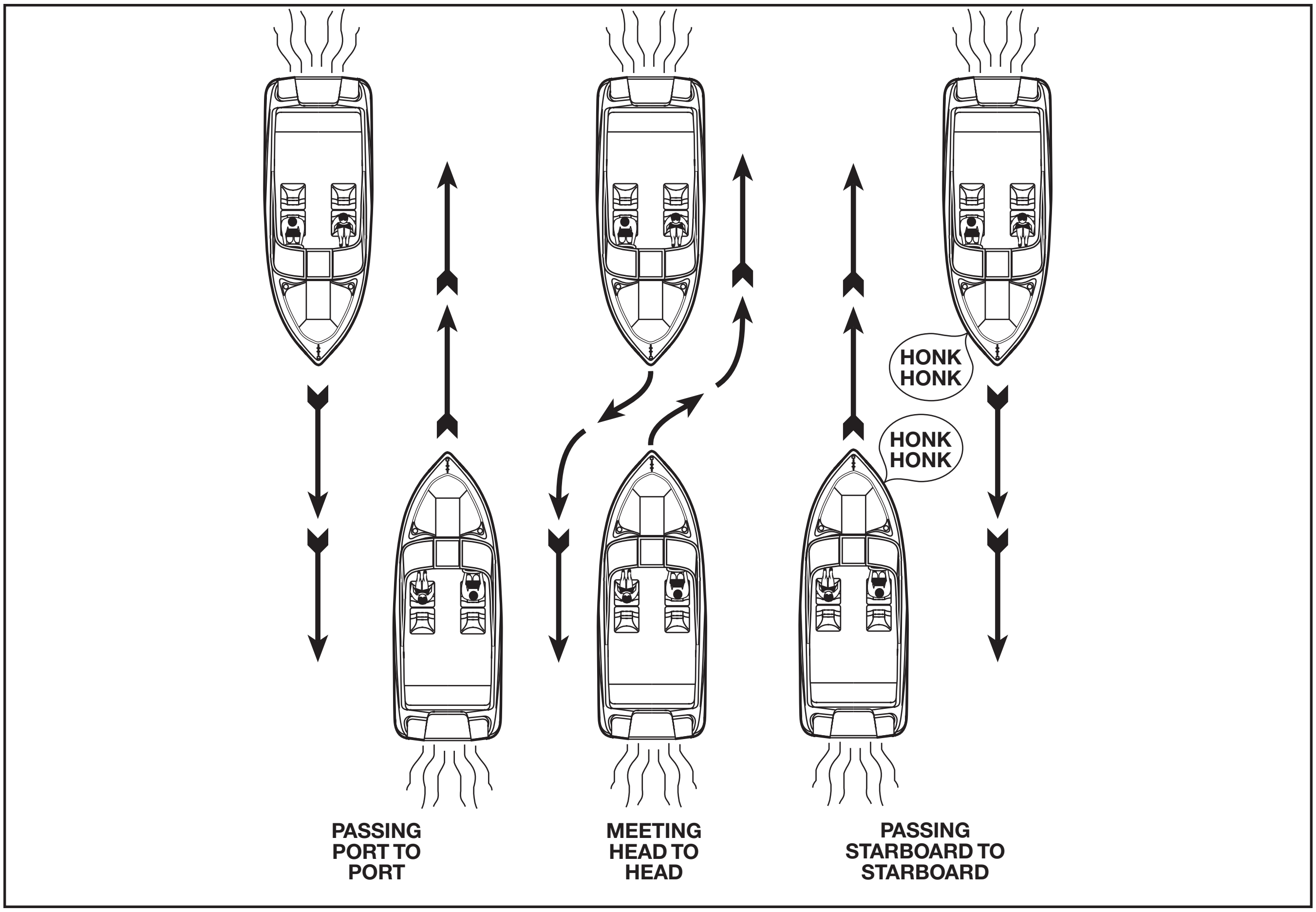


FIGURE 2.11 MEETING HEAD-ON

servicing navigational markers among others.

- A vessel engaged in fishing. These include boats fishing with lines, trawls or nets; but not trolling lines.
- Sailboats. Sailboats have the right-of-way over power boats; however, if a sailboat is using a propeller to move forward, it is considered a power boat even if its sails are up.

MEETING A VESSEL HEAD-ON

In a head-on situation, neither boat has the right-of way. Both boats should decrease speed and pass port to port **(Figure 2.11)**. However, if both boats are on the left side of a channel, each vessel should sound two short horn blasts and pass starboard to starboard.

CROSSING SITUATIONS

In a crossing situation, the boat on the right from the 12-4 o'clock position has the right-of-way. It must hold course and speed. The boat without right-of-way must keep clear and pass to the stern as shown on **Figure 2.12**.

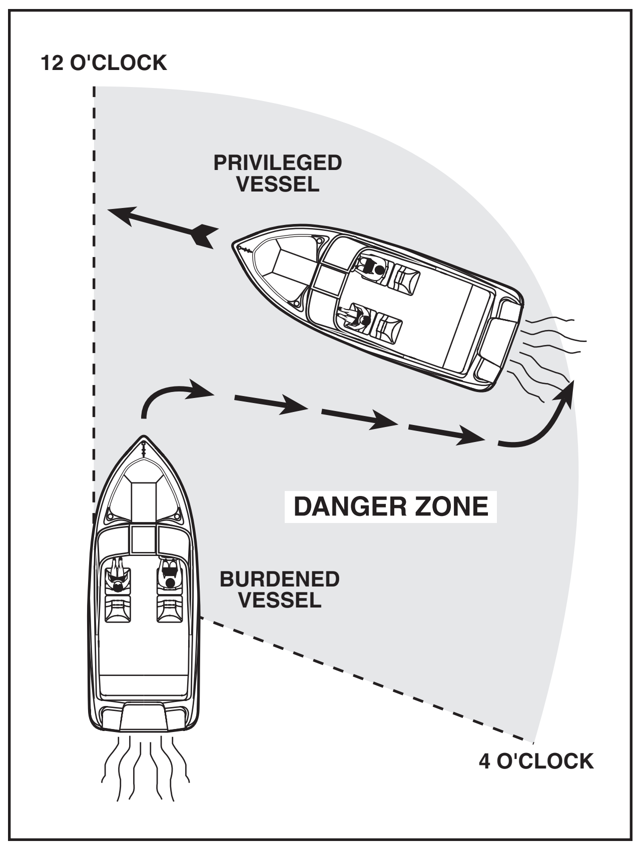


FIGURE 2.12 CROSSING

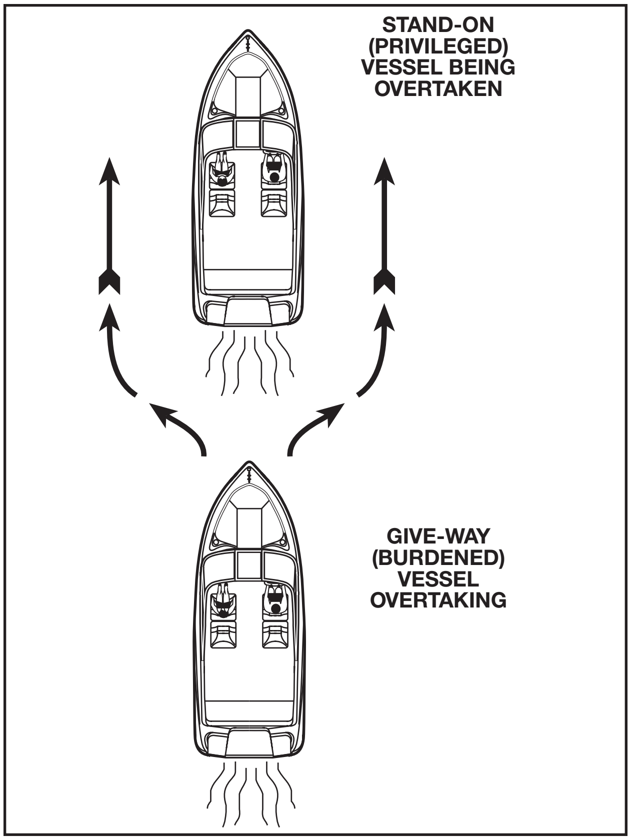


FIGURE 2.13 OVERTAKING

OVERTAKING

The boat overtaking the one ahead must yield the right-of-way to the boat being passed. The overtaking boat must make any necessary adjustments to keep out of its path. See **Figure 2.13**. The boat being passed should hold its course and speed.

WHISTLE SIGNALS

Out on the water, whistle signals are commonly used. Although using a whistle signal is not necessary every time a boat is nearby, operators must signal their intentions when necessary to avoid potentially confusing or hazardous situations. It is customary for the privileged boat to signal first and the give-way boat to return the same signal to acknowledge she understands and will comply. Use the danger signal (five or more short and rapid blasts) if intent is not clear. A short blast is 1 or 2 seconds long. A long blast is 4 to 6 seconds long.

USE WHISTLE BLASTS EARLY ENOUGH TO BE NOTICED AND UNDERSTOOD BY OTHER BOATERS. The Navigational Aids Chart at the

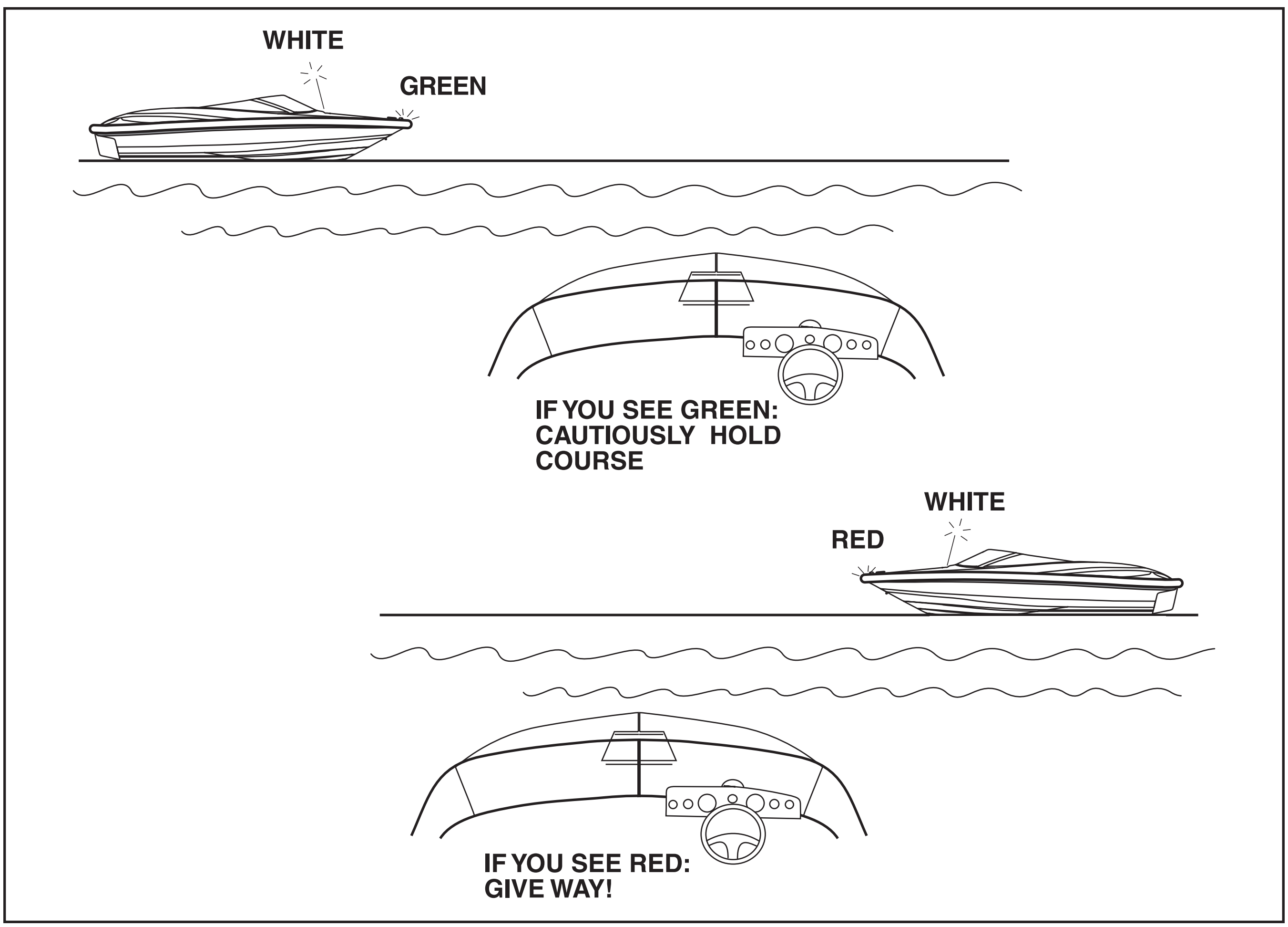


FIGURE 2.14 NIGHT RUNNING

end of this section lists the meanings of the various whistle signals.

THE GENERAL PRUDENTIAL RULE

The general prudential rule regarding right-of-way is that if a collision appears unavoidable, neither boat has right-of-way. As prescribed in the Rules of the Road, both boats must act to avoid collision.

NIGHT RUNNING

Boats operating between sunset and sunrise (hours vary by state), or in conditions of reduced visibility, must use navigational lights. Nighttime operation, especially during bad weather or fog, can be dangerous. All Rules of Road apply at night, but it is best to slow down and stay clear of all boats regardless of who has right-of-way.

To see more easily at night, avoid bright lights when possible. Also, it is helpful to have a passenger keep watch for other boats, water hazards and navigational aids.

To determine the size, speed and direction of other vessels at night, you should use the running lights. A green light indicates the starboard side, and a red light indicates the port side. Generally, if you see a green light, you have the right-of-way; if you see a red light, give way to the other vessel. See **Figure 2.14**.

NAVIGATIONAL AIDS CHART

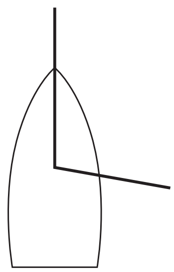
The illustrated Navigational Aids Chart located on the next page contains information concerning whistle signals, storm warnings, bridge signals and buoy descriptions and information.

Navigational Aids Chart

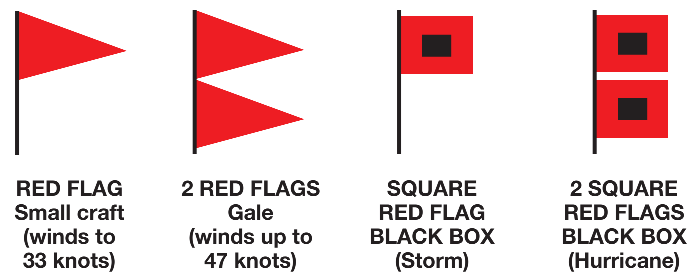
REMEMBER THESE RULES

1. **OVERTAKING - PASSING: Boat being passed has the right-of-way. KEEP CLEAR.**
2. **MEETING HEAD ON: Keep to the right.**
3. **CROSSING: Boat on right has the right-of-way. Slow down and permit boat to pass.**

← PORT / STARBOARD →



STORM WARNINGS



WHISTLE SIGNALS

ONE LONG BLAST: Warning signal (Coming out of slip)

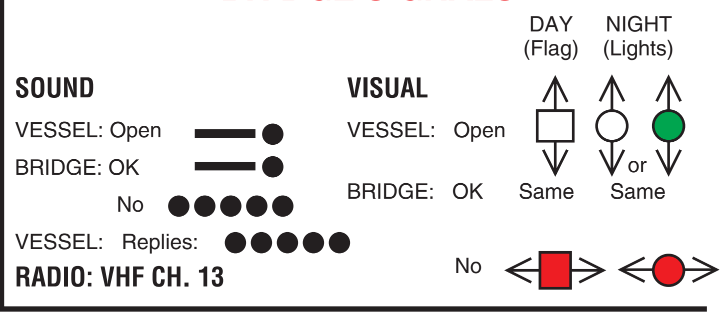
ONE SHORT BLAST: Pass on my port side

TWO SHORT BLASTS: Pass on my starboard side

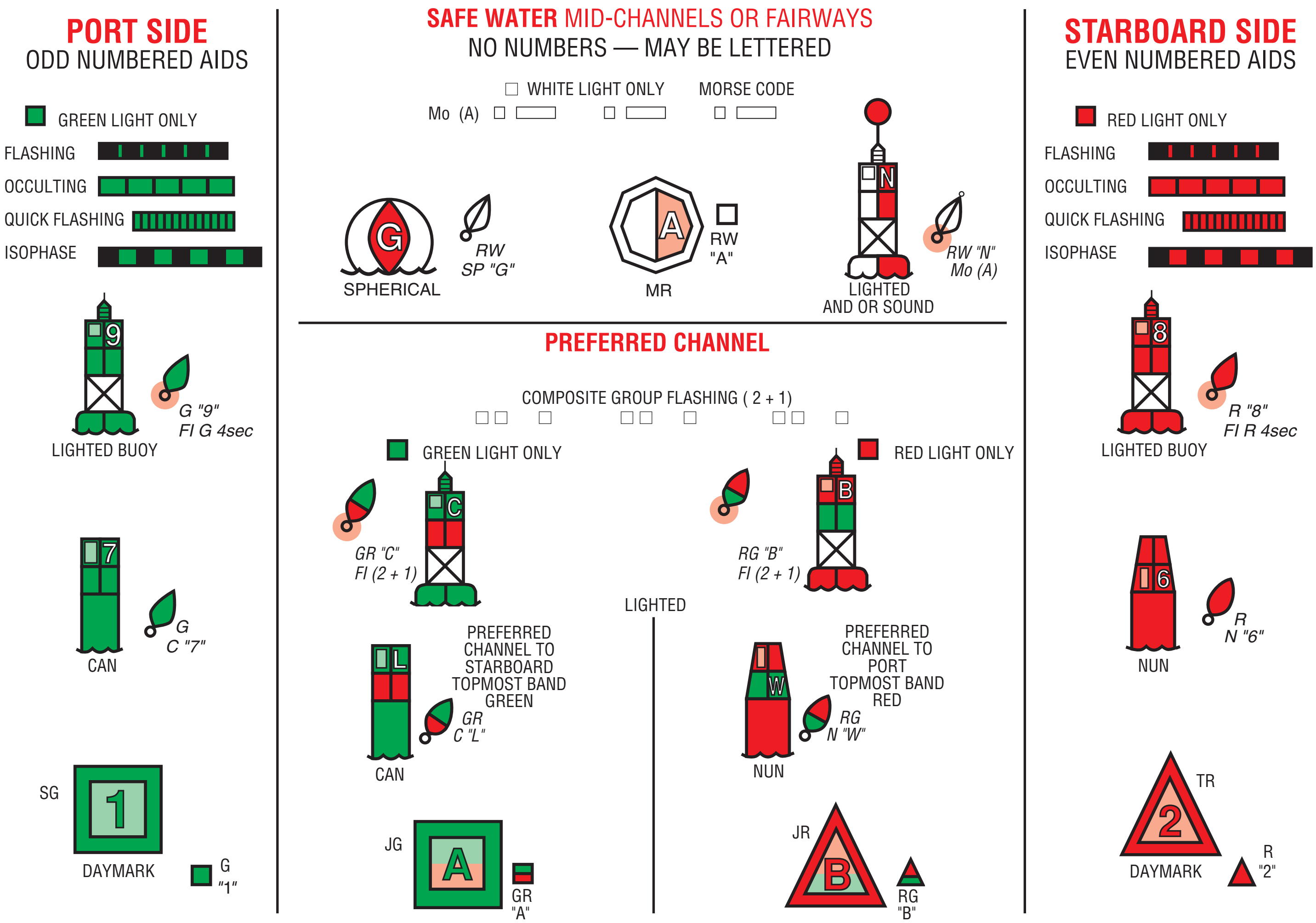
THREE SHORT BLASTS: Engine(s) in reverse

FOUR OR MORE BLASTS: Danger signal

BRIDGE SIGNALS



LATERAL AIDS AS SEEN ENTERING FROM SEAWARD



This owner's manual covers a number of Wellcraft models. The specifications for these models are detailed in this section. You will need to become aware of your boat's dimensions, weight, bridge clearance and draft and learn the importance of these measurements.

NOTE: In all specifications, bridge clearance dimension is figured with average load. Antenna, canvas etc. are not included.

Figures 3.1–3.7 show the general locations of equipment and many through–hull fittings on various Wellcraft cruiser models. Depending on model, this equipment is standard, optional, or not available. Seacocks are generally near the component they serve. The locations of fills, vents and other equipment may vary from model to model. Check with your dealer if you have any questions about how your boat is equipped.

1......FUSE PANEL
2......FUEL TANK VENT & FILL
3......WASTE TANK
4......LOWER UNIT TRIM
5......STERN LIGHT BASE WITHOUT RADAR ARCH
6......TRIM TAB PUMP
7......BATTERY TRAY IN ENGINE ROOM
8......WATER PUMP
9......BATTERY SWITCH
10......WATER FILL & VENT
11......SHORE POWER OUTLET
12......AC/DC PANEL
13......WASTE PUMPOUT
14......WASTE TANK VENT
15......SHOWER SUMP DISCHARGE
16......COCKPIT DRAIN DISCHARGE
17......AIR CONDITIONER DISCHARGE
18......AIR CONDITIONER UNIT
19......SINK DRAIN
20......COCKPIT DRAIN
21......SHOWER SUMP
22......BILGE PUMP DISCHARGE
23......OVERBOARD DISCHARGE

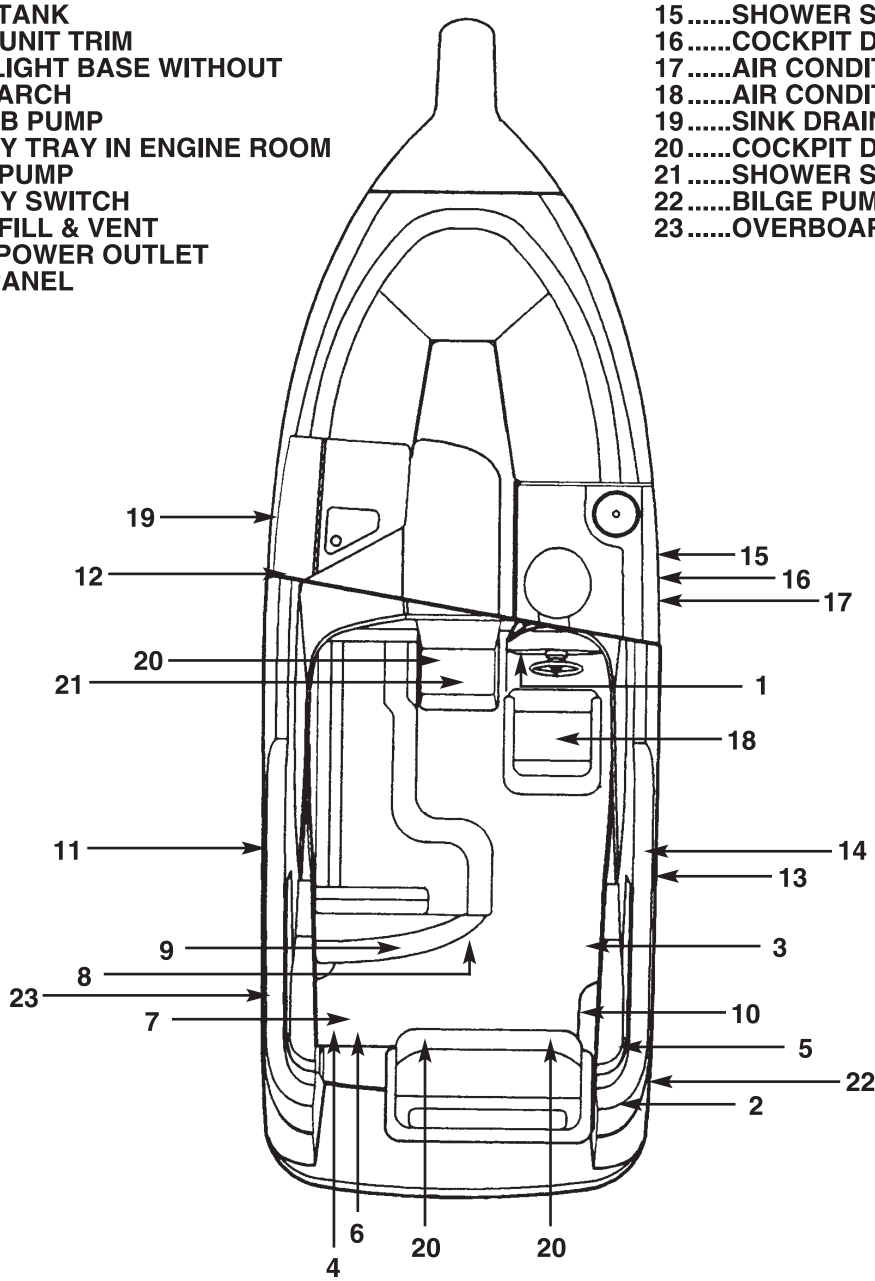


FIGURE 3.1 2400 MARTINIQUE

1 ......FUSE PANEL
2 ......SHOWER SUMP DISCHARGE
3 ......COCKPIT DRAIN DISCHARGE
4 ......AIR CONDITIONER PUMP DISCHARGE
5 ......WASTE PUMPOUT
6 ......WASTE TANK VENT
7 ......WATER TANK VENT & FILL
8 ......WATER PUMP
9 ......STERN LIGHT WITHOUT RADAR ARCH
10 ......COCKPIT DRAIN
11 ......FUEL VENT & FILL
12 ......BILGE PUMP DISCHARGE
13 ......LOWER UNIT TRIM
14 ......TRIM TAB RESERVOIR
15 ......COCKPIT DRAIN
16 ......BATTERY TRAY
17 ......BATTERY SWITCH
18 ......MACERATOR DISCHARGE
19 ......SHOWER SUMP
20 ......SHOREPOWER OUTLET
21 ......AC/DC PANEL
22 ......SINK DRAIN
23 ......AIR CONDITIONER UNIT

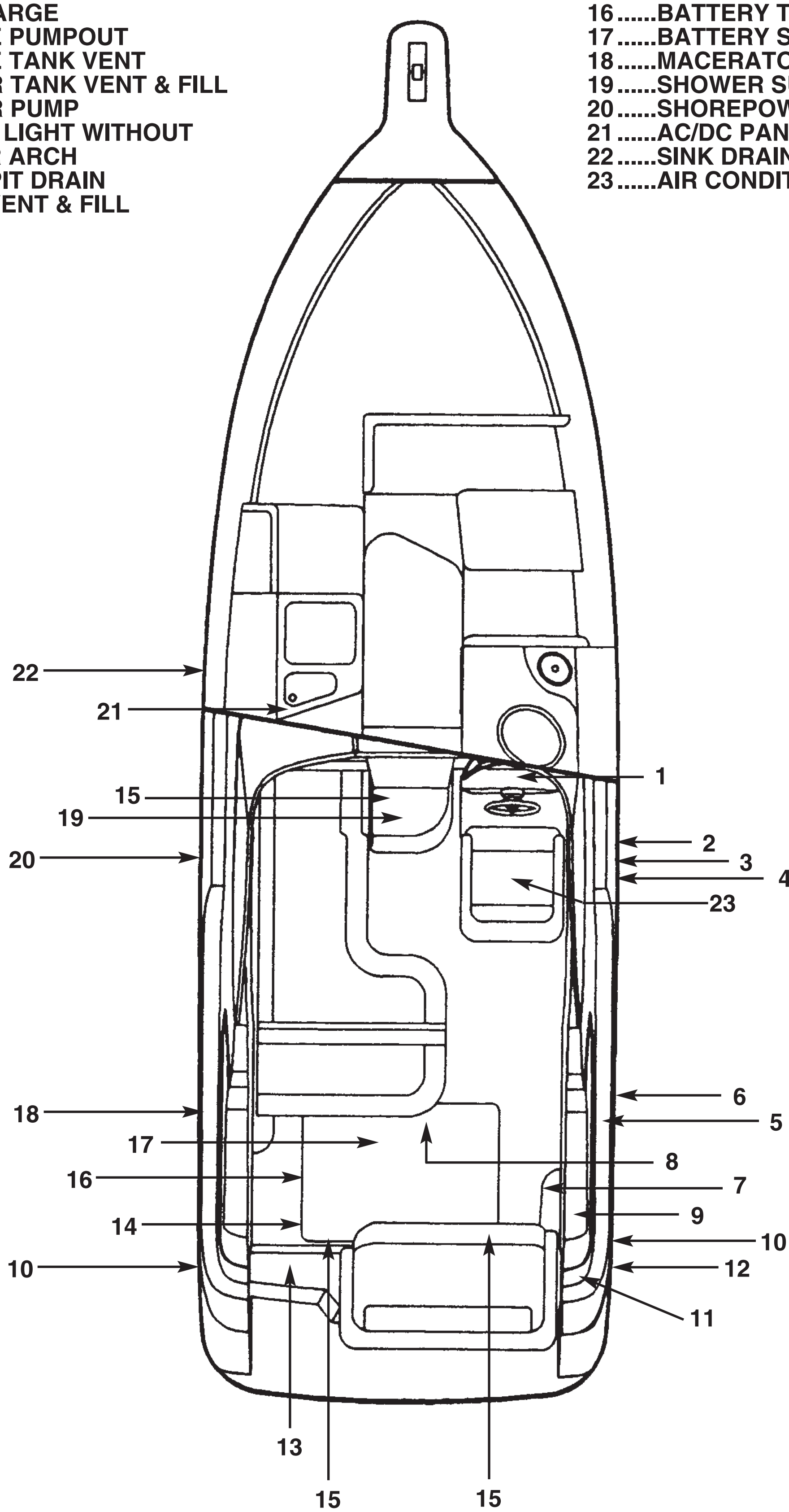


FIGURE 3.2 2600 MARTINIQUE

1......AIR CONDITIONER DISCHARGE
2......SPRING CLEAT DRAIN
3......WATER FILL & VENT
4......COCKPIT FLOOR DRAIN
5......BILGE PUMP DISCHARGE
6......HIGH WATER BILGE PUMP DISCHARGE
7......GENERATOR DISCHARGE
8......OVERBOARD DISCHARGE
9......FUEL FILL & VENT
10......WASTE VENT
11......WASTE PUMPOUT
12......12 VOLT CIRCUIT BREAKERS
13......SHOWER SUMP DISCHARGE
14......FORWARD BILGE PUMP DISCHARGE
15......HEAD SINK DRAIN
16......GALLEY DRAIN

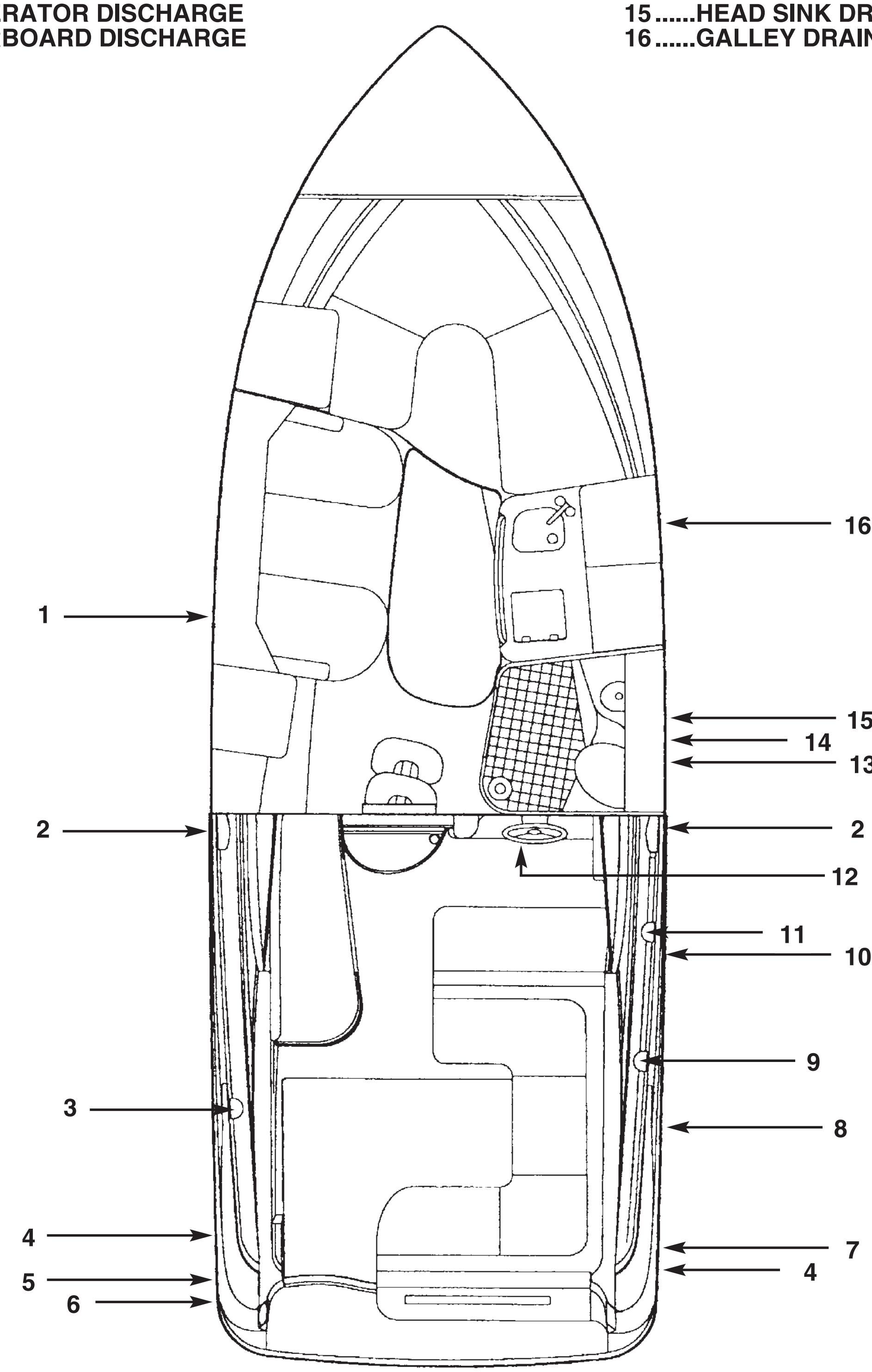


FIGURE 3.3 2800 MARTINIQUE

1......GENSET BATTERY
2......AIR CONDITIONER DISCHARGE
3......CIRCUIT BREAKERS ON HELM
4......WATER FILL WITH VENT
5......BATTERIES (2)
6......A/C SEACOCK & STRAINER
7......GENSET
8......FORWARD BILGE PUMP DISCHARGE
9......GENSET EXHAUST
10......BILGE PUMP DISCHARGE
11......FUEL FILL WITH VENT
12......COCKPIT DRAINS
13......CITY WATER INLET
14......TRIM TAB RESERVOIR
15......WASTE TANK VENT
16......SHOWER SUMP DISCHARGE
17......SHORE POWER OUTLET
18......TELEPHONE/TV OUTLET
19......AC/DC PANEL
20......BATTERY SWITCHES
21......FRESHWATER PUMP
22......SHOWER SUMP
23......WASTE PUMPOUT
24......HEAD SINK DRAIN
25......GALLEY SINK DRAIN
26......COCKPIT SINK DRAIN
27......COCKPIT DRAIN
28......DUNNAGE BOX DRAIN

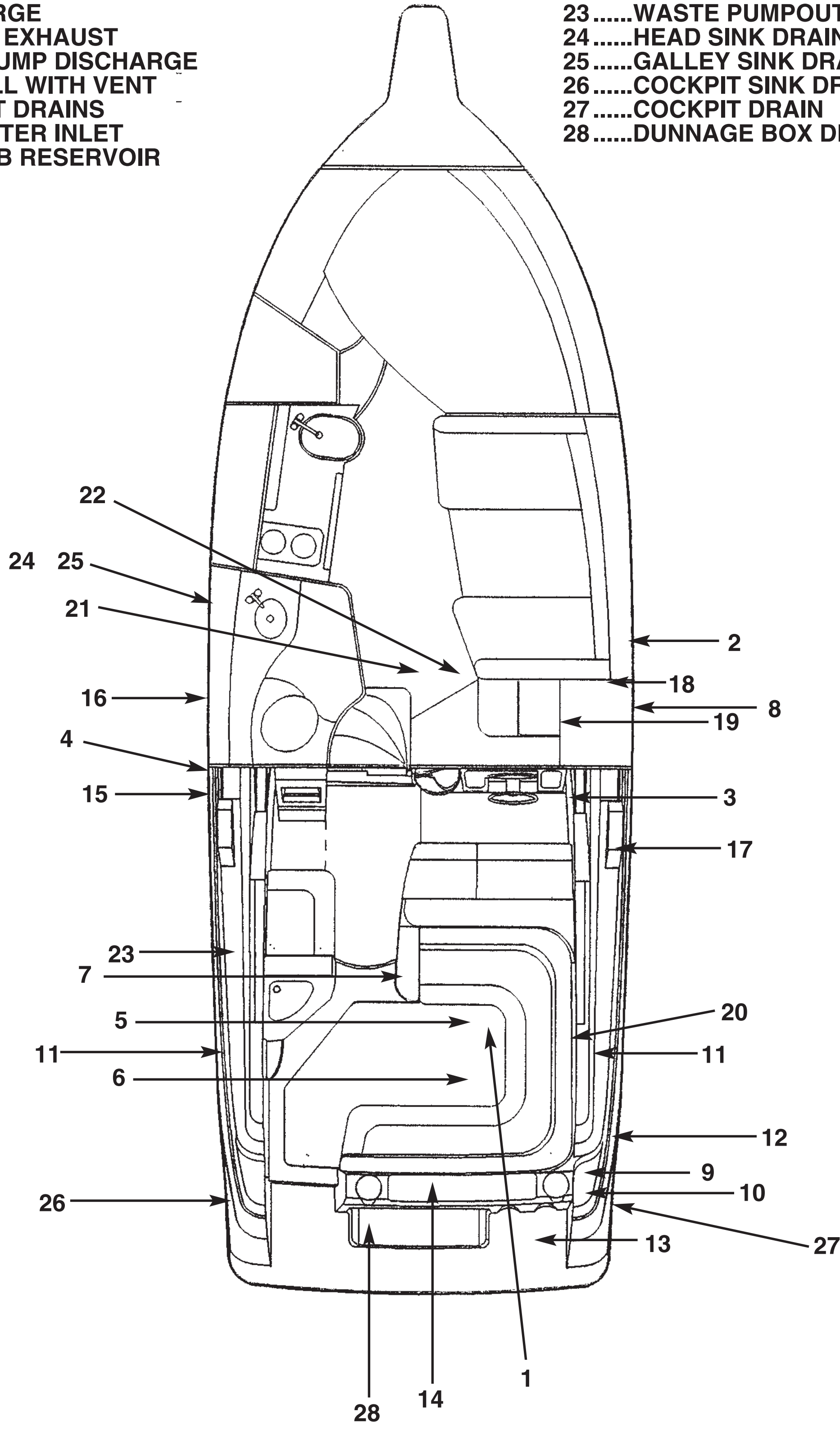


FIGURE 3.4 3000 MARTINIQUE

1......HEAD VANITY DISCHARGE
2......GALLEY SINK DISCHARGE
3......SUMP DISCHARGE
4......A/C D/C PANEL (BREAKERS)
5......FRESH WATER PUMP
6......SHOWER SUMP
7......A/C SEACOCK & STRAINER
8......WASTE PUMPOUT
9......WASTE TANK VENT
10......SHORE POWER
11......FUEL TANK FILL & VENT
12......GENSET
13......BATTERY SWITCHES
14......WET BAR DISCHARGE
15......CITY WATER INLET
16......TRIM TAB RESERVOIR
17......BATTERIES
18......AFT BILGE PUMP DISCHARGE
19......FUEL FILL/VENT
20......WATER FILL
21......FWD BILGE PUMP DISCHARGE
22......CIRCUIT BREAKERS AT HELM
23......A/C SUMP
24......TV & TELEPHONE OUTLET
25......AIR CONDITIONER

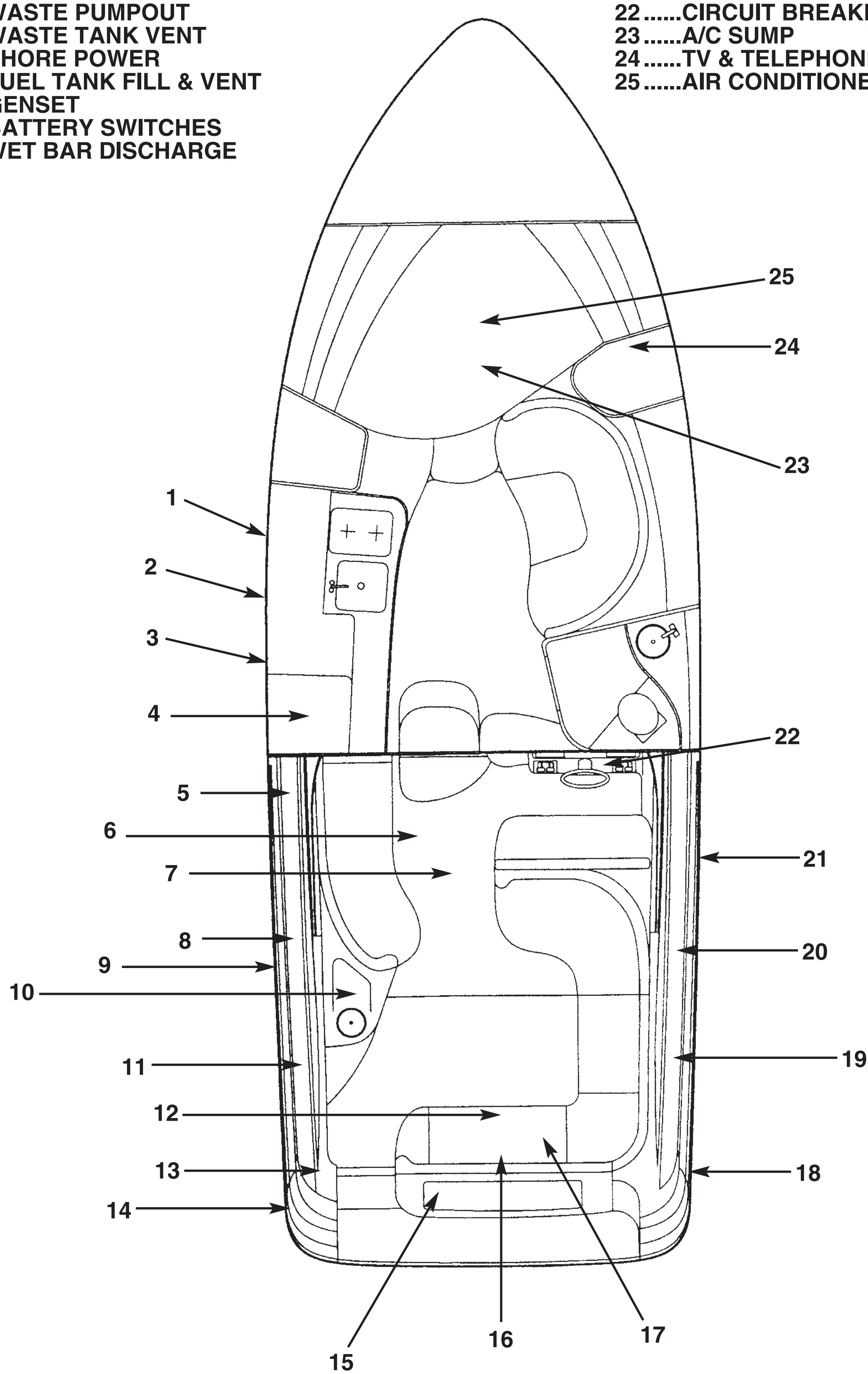


FIGURE 3.5 3300 MARTINIQUE

1......#1 PORT, #2 STARBOARD/
HOUSE BATTERY SWITCHES
2......AC/DC PANEL
3......SHORE POWER INLET
4......TELEPHONE/TV OUTLET
5......CIRCUIT BREAKERS
6......FUEL FILL & VENT
7......BATTERIES (2)
8......FUEL VALVES
9......UPPER DECK DRAIN
10......LIVEWELL DRAIN
11......GENSET
12......HATCH DRAIN (2)
13......GENSET EXHAUST
14......BILGE PUMP DISCHARGE
15......BAIT STATION SINK DRAIN
16......UPPER DECK DRAIN
17......WATER FILL & VENT
18......MACERATOR DISCHARGE
19......SINK DRAIN
20......SUMP PUMP DRAIN
21......SHORE POWER OUTLET
22......SHOWER SUMP
DISCHARGE
23......GALLEY SINK DRAIN

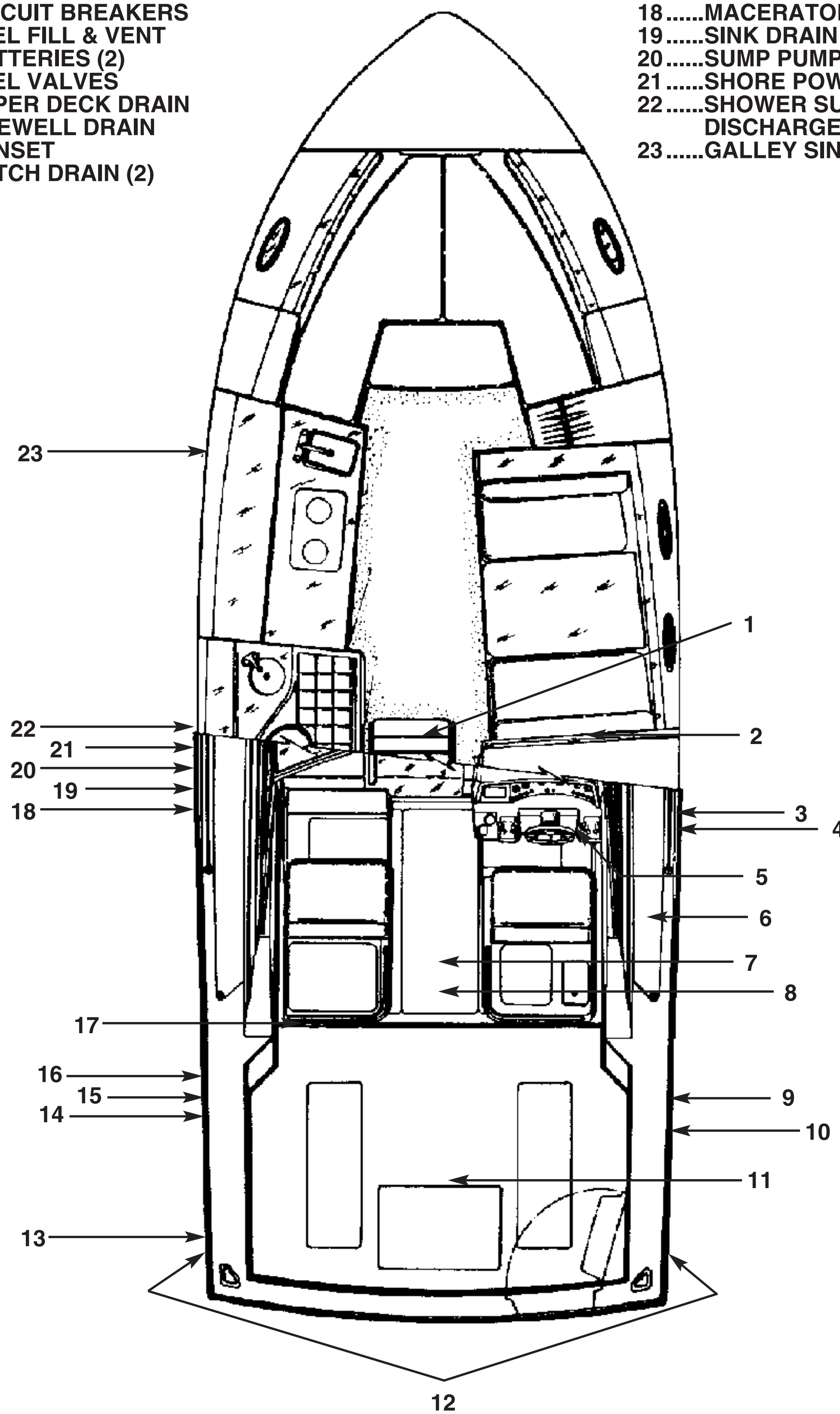


FIGURE 3.6 330 COASTAL

1......TELEPHONE OUTLET
2......HEAD SINK DISCHARGE
3......GALLEY SINK DISCHARGE
4......SUMP PUMP DISCHARGE
5......AC OUTLET
6......A/C D/C PANEL
7......AIR CONDITIONER STRAINER & SEACOCK
8......WASTE TANK PUMPOUT
9......WASTE TANK VENT
10......FUEL TANK FILL & VENT
11......WET BAR DISCHARGE
12......GENERATOR
13......BATTERY SWITCHES
14......CITY WATER INLET
15......TRIM TAB RESERVOIR
16......BATTERIES
17......AFT BILGE PUMP DISCHARGE
18......WATER TANK FILL & VENT
19......AIR CONDITIONER
20......FORWARD BILGE DISCHARGE
21......CIRCUIT BREAKERS (12 VOLTS)
22......TV & TELEPHONE OUTLET
23......AIR CONDITIONER & HEAD SUMP
24......AIR CONDITIONER UNIT

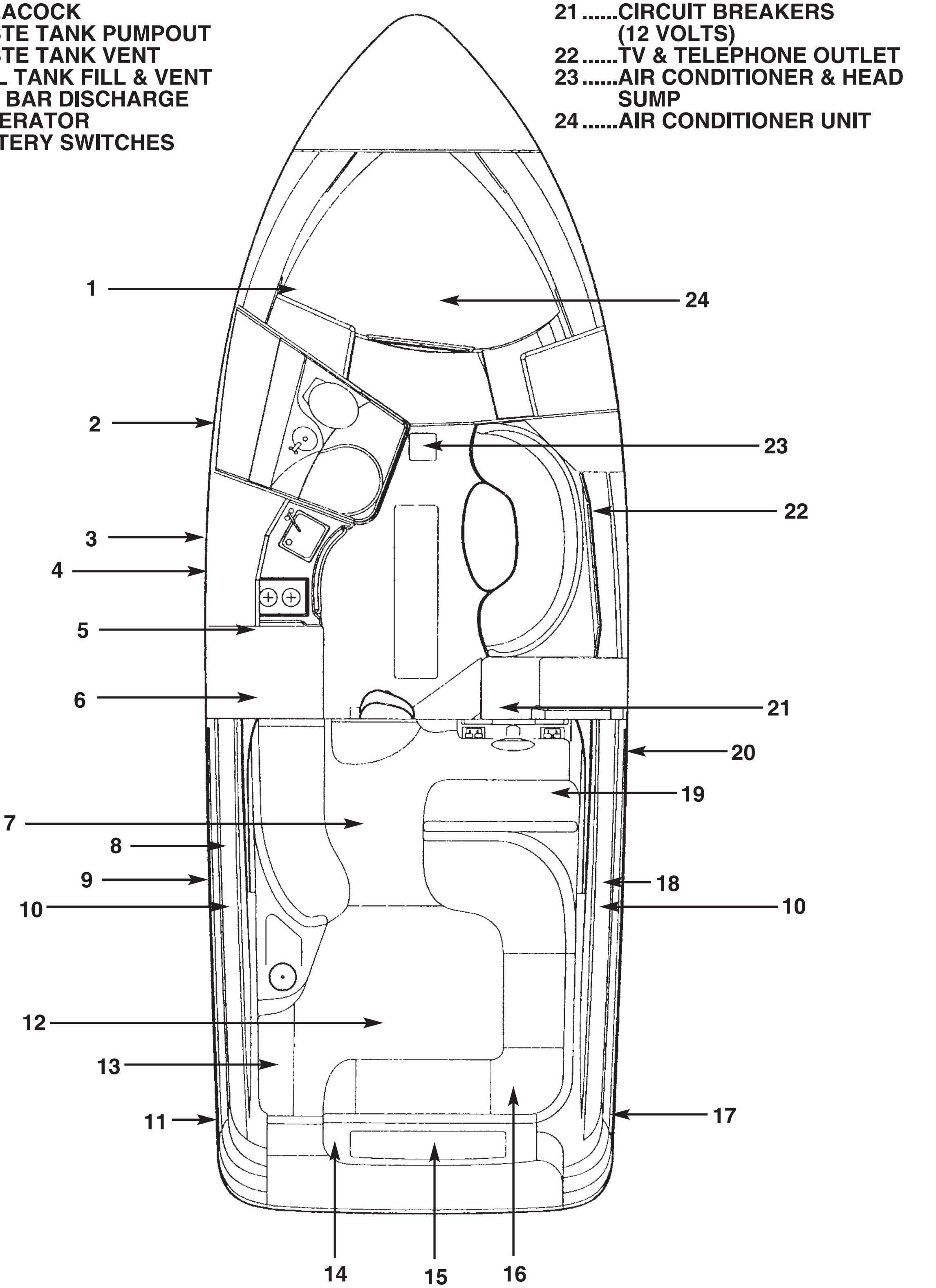


FIGURE 3.7 3700 MARTINIQUE

2400 MARTINIQUE

	Metric	US
Design Category	C (Inshore)	
Certification	CE	
Length Overall		
(w/pulpit)	7.75 m	25'5"
Centerline Length	7.01 m	23'0"
Beam	2.59 m	8'6"
Dry\Unladen Weight	2041.2 kg	4,500 lb
Maximum Load		
Weight	1174 kg	2,590 lb
Persons	8	8
Fuel Capacity (gas)	230.89 l	61 gal
Water Capacity	98.41 l	26 gal
Holding Tank Capacity	45.42 l	12 gal
Deadrise	20°	20°
Draft: drive up	0.51 m	20"
Draft: drive down	1.02 m	40"
Bridge Clearance*	1.91 m	6'3"
Sleeping Capacity		
(persons)	4	4
Headroom	1.83 m	6'0"
Max HP @ Prop	209kw	280HP

2600 MARTINIQUE

	Metric	US
Design Category	B (Offshore)	
Certification	CE	
Length Overall		
(w/pulpit)	8.36 m	27'5"
Centerline Length		
(w/o pulpit)	7.93 m	26'0"
Beam	2.59 m	8'6"
Dry\Unladen Weight	2268 kg	5,000 lb
Maximum Load		
Weight	1350	N/A
Persons	8	N/A
Fuel Capacity (gas)	291.45 l	77 gal
Fresh Water Tank		
Capacity	98.41 l	26 gal
Holding Tank Capacity	45.42 l	12 gal
Deadrise	20°	20°
Draft: drive up	0.49 m	19"
Draft: drive down	1.02 m	40"
Bridge Clearance*	1.98 m	6'6"
Sleeping Capacity		
(persons)	4	4
Headroom	1.83 m	6'0"
Max HP @ Prop	231kw	310HP

2800 MARTINIQUE

	Metric	US
Design Category	B (Offshore)	
Certification		NMMA
Length Overall		
(w/pulpit)	8.48 m	27'10"
Beam	2.9 m	9'6"
Dry\Unladen Weight	3266 kg	7,200 lb
Fuel Capacity (gas)	378.5 l	100 gal
Fresh Water Tank		
Capacity	132.51 l	35 gal
Holding Tank Capacity	113.6 l	28 gal
Deadrise	20°	20°
Draft: drive up	0.43 m	17"
Draft: drive down	.71 m	28"
Bridge Clearance*	2.16 m	7'1"
Headroom	1.88 m	6'2"
Sleeping Capacity		
(persons)	6	6
Max HP @ Prop	313.2kw	420HP

3000 MARTINIQUE

	Metric	US
Design Category	B (Offshore)	
Certification	CE	
Length Overall		
(w/pulpit)	9.85 m	32'4"
Centerline Length	9.3 m	30'6"
Beam	3.20 m	10'6"
Dry\Unladen Weight	4990 kg	11,000 lb
Maximum Load		
Weight	2500 kg	N/A
Persons	12	N/A
Fuel Capacity (gas)	605.6 l	160 gal
Water Capacity	155.18 l	41 gal
Holding Tank Capacity	75.7 l	20 gal
Deadrise	16°	16°
Draft: drive up	0.69 m	27"
Draft: drive down	.94 m	37"
Bridge Clearance*	2.62 m	8'7"
Sleeping Capacity		
(persons)	6	6
Headroom	1.91 m	6'3"
Max HP @ Prop	417kw	560HP

*Dimension with average load; antennas, canvas, etc. not included

SPECIFICATIONS

3300 MARTINIQUE

	Metric	US
Design Category	B (Offshore)	
Certification		NMMA
Length Overall	10.1 m	33'2"
Beam	3.53 m	11'7"
Dry\Unladen Weight	4990 kg	11,000 lb
Fuel Capacity (gas)	855.41 l	226 gal
Water Capacity	151.4 l	40 gal
Holding Tank Capacity	132.48 l	35 gal
Deadrise	22°	22°
Draft:	0.84 m	35"
Bridge Clearance (w/arch)*	2.74 m	9'0"
Sleeping Capacity (persons)	6	6
Headroom	1.9 m	6'3"
Max HP @ Prop	567kw	760HP

330 COASTAL

	Metric	US
Design Category	B (Offshore)	
Length Overall	11.76 m	38'7"
Hull Length	10.16 m	33'4"
Beam	3.86 m	12'8"
Dry\Unladen Weight (w/gas)	7257.60 kg	16,000 lb
Maximum Load		
Weight	2500	N/A
Persons	12	N/A
Fuel Capacity (gas)	1090.20 l	288 gal
Fresh Water Tank Capacity	196.84 l	52 gal
Holding Tank Capacity	75.7 L	20 gal
Deadrise	16°	16°
Draft: down	0.91 m	36"
Bridge Clearance*	2.97 m	9'9"
Headroom	2.00 m	6'7"
Sleeping Capacity (persons)	4	4
Max HP @ Prop	552kw	740HP

3700 MARTINIQUE

	Metric	US
Design Category	B (Offshore)	
Certification		NMMA
Length Overall	11.25 m	36'11"
Beam	3.96 m	13'0"
Dry\Unladen Weight (approx. w/engine)	7711 kg	16,400 lb
Fuel Capacity	1090 l	288 gal
Fresh Water Tank Capacity	216 l	57 gal
Holding Tank Capacity	132 l	35 gal
Deadrise	22°	22°
Draft	1.02 m	40"
Bridge Clearance (w/arch)*	2.87 m	9'5"
Headroom	1.9 m	6'3"
Sleeping Capacity (persons)	6	6
Max HP @ Prop	567kw	760HP

SAFETY LABEL LOCATIONS

Safety labels are placed at various locations on your boat to alert you to potentially hazardous conditions. **Figures 3.8–3.14** show the locations of these safety labels. Check with your dealer if you have any questions about safety labels or replacing labels if they are missing from your boat.

Be sure to read ALL hazard labels. Understanding the information on these labels is of vital importance.

*Dimension with average load; antennas, canvas, etc. not included

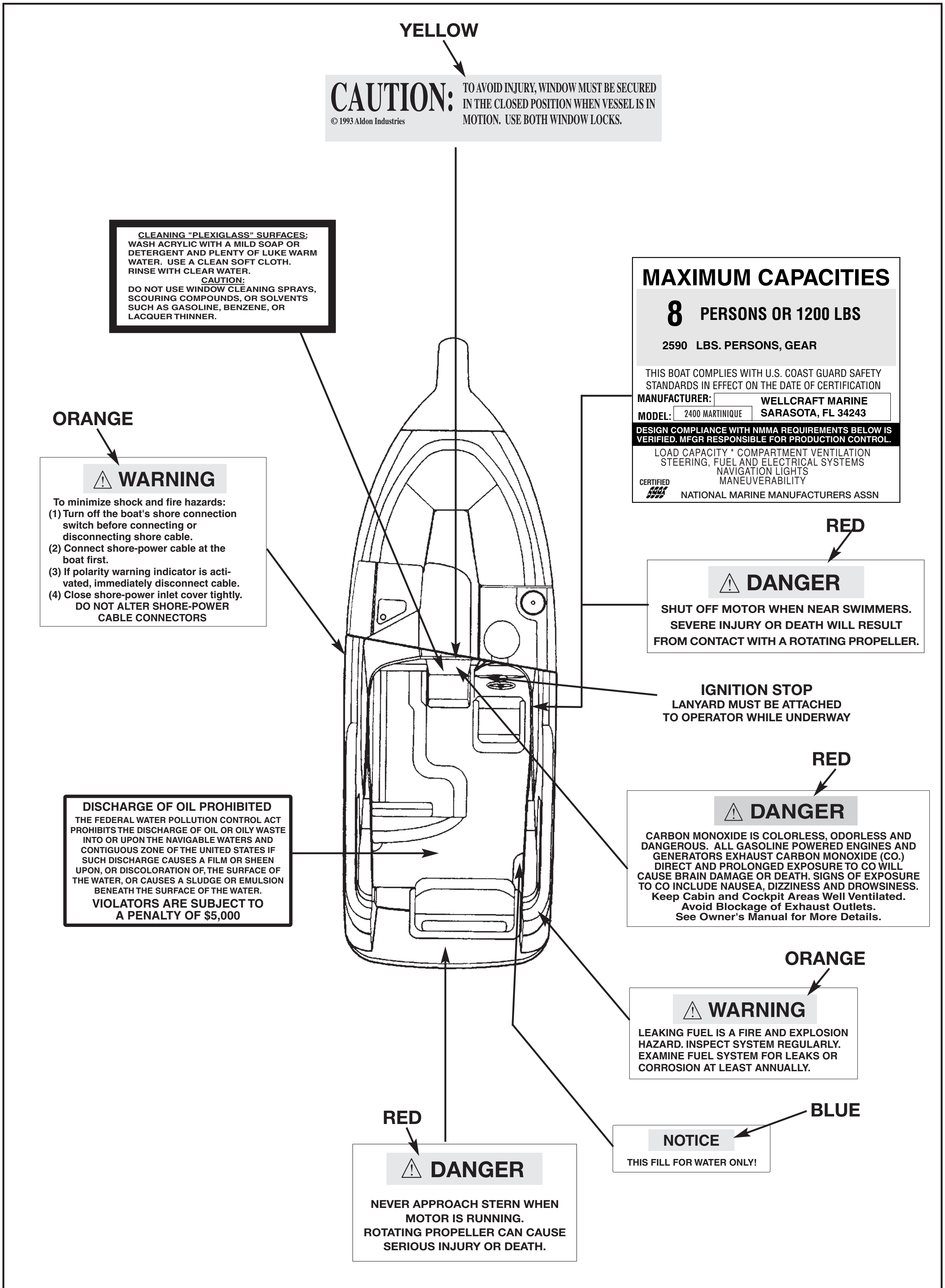


FIGURE 3.8 2400 MARTINIQUE

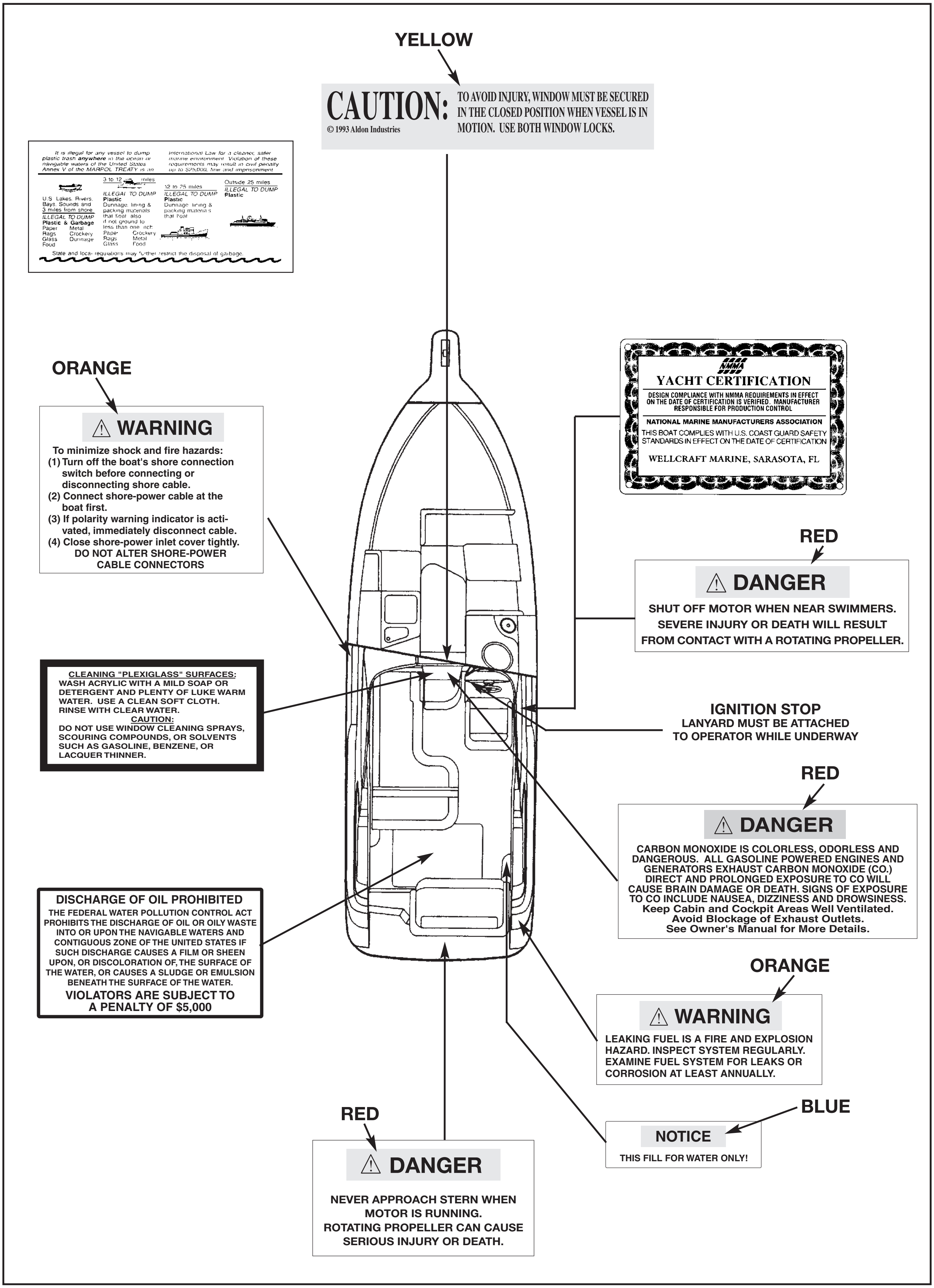


FIGURE 3.9 2600 MARTINIQUE

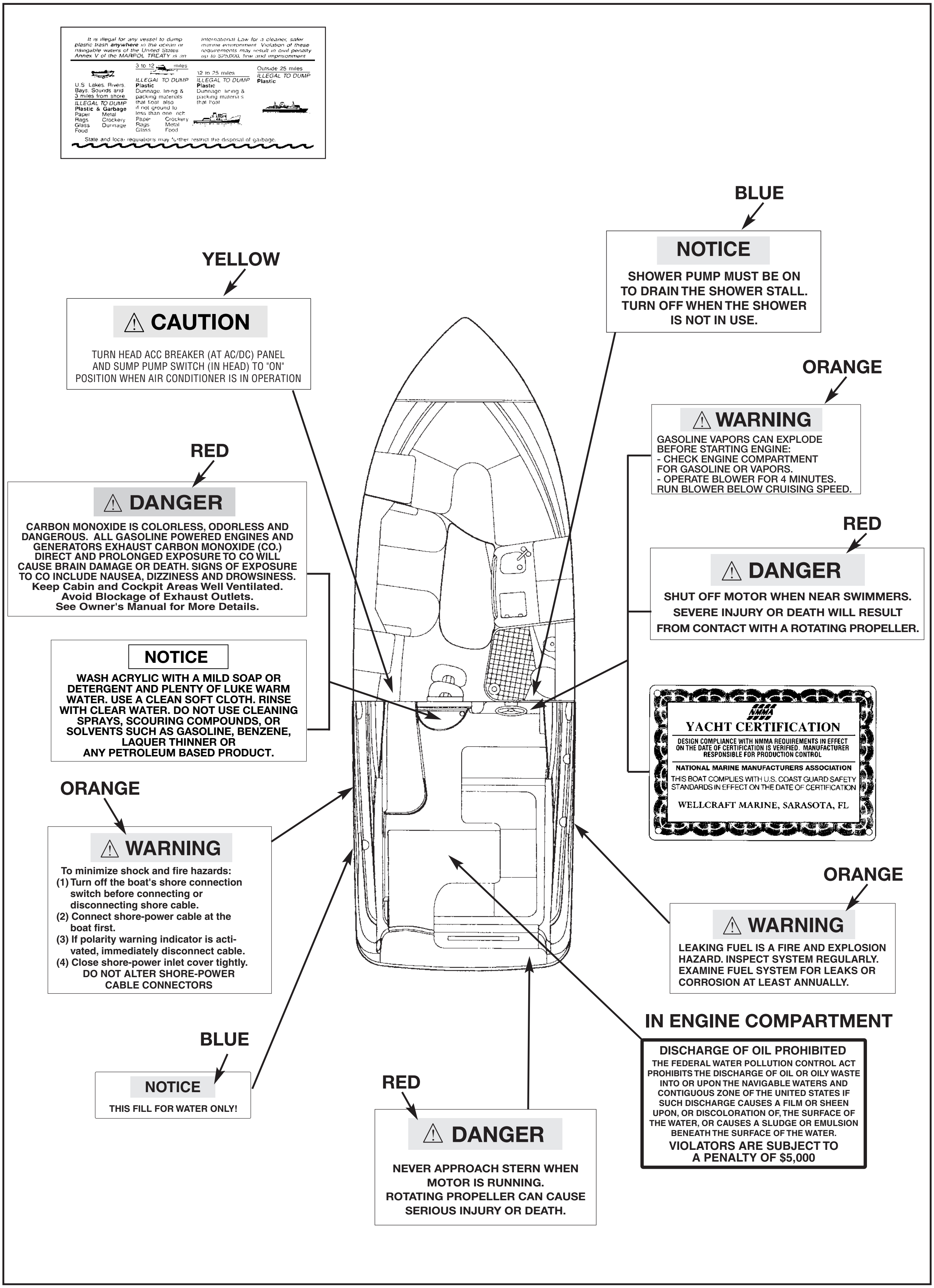


FIGURE 3.10 2800 MARTINIQUE

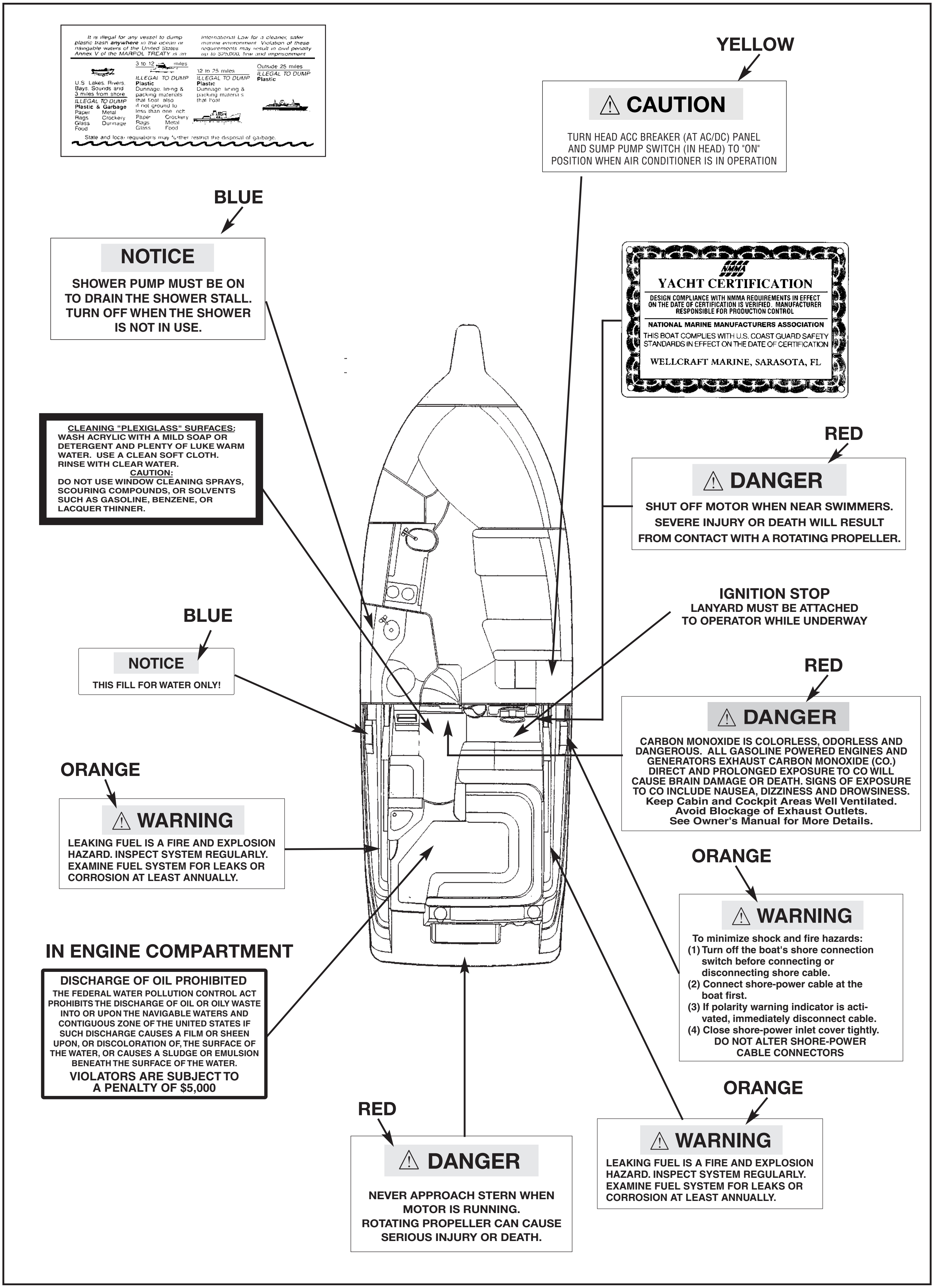


FIGURE 3.11 3000 MARTINIQUE

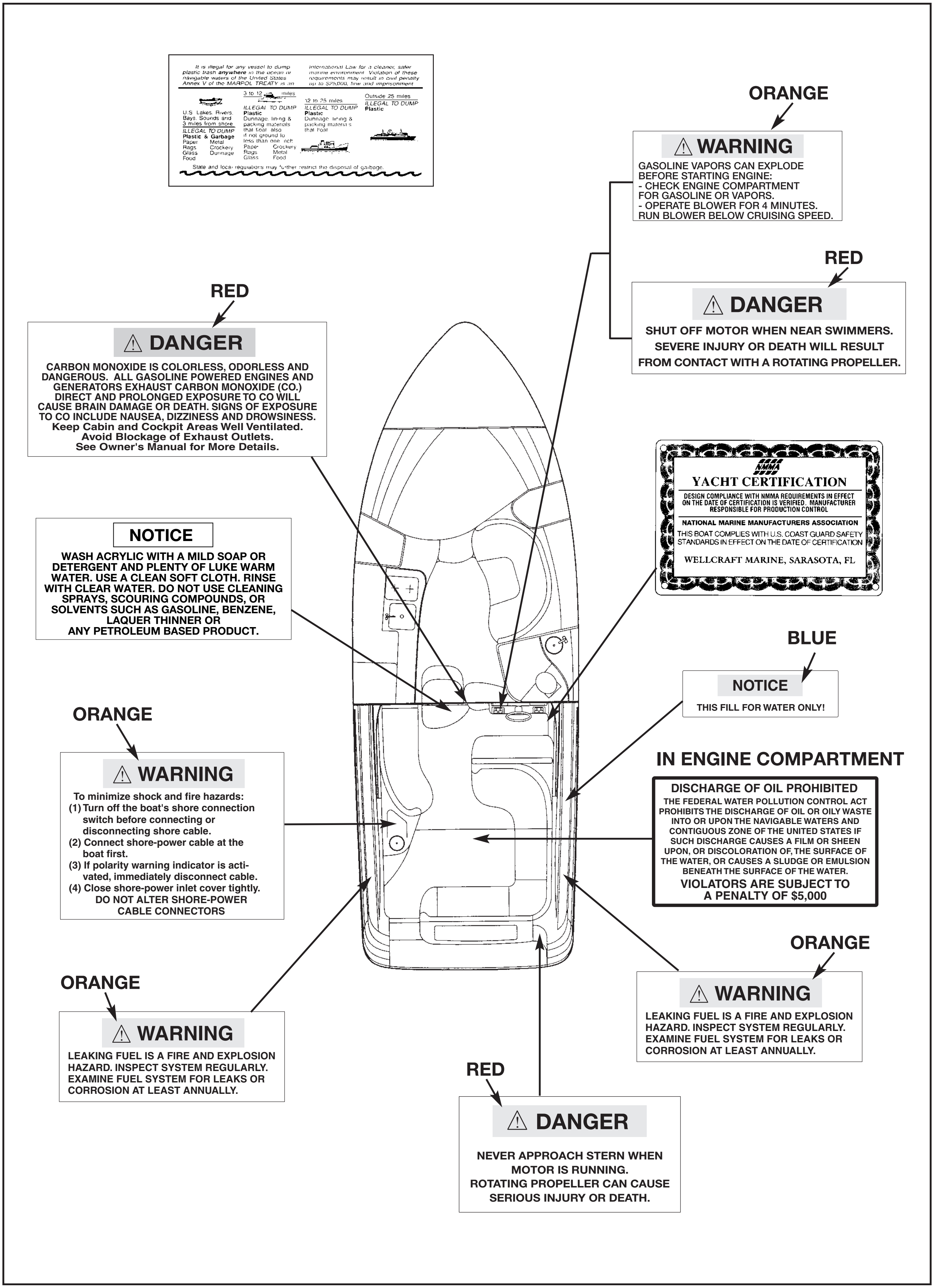


FIGURE 3.12 3300 MARTINIQUE

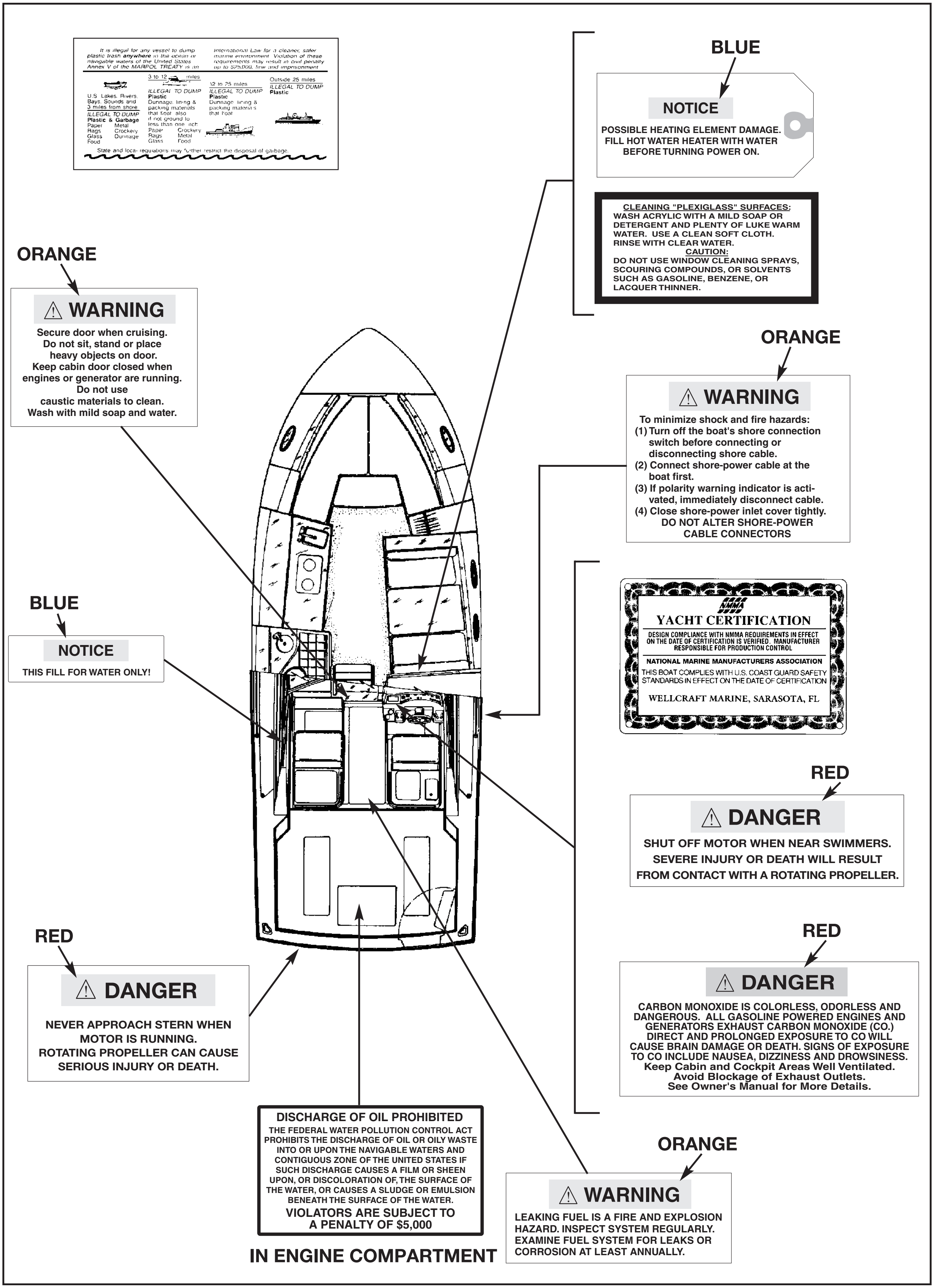


FIGURE 3.13 330 COASTAL

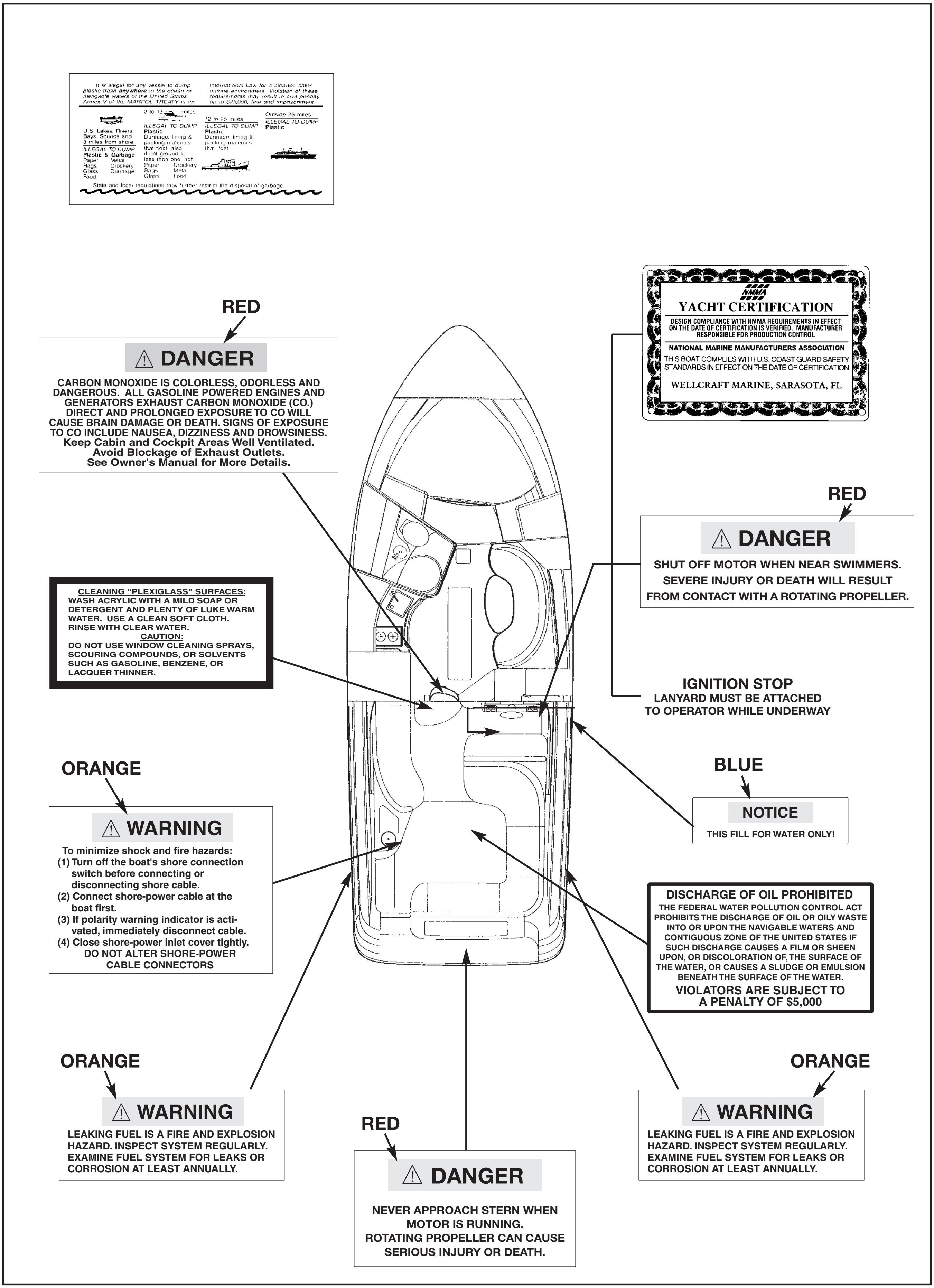


FIGURE 3.14 3700 MARTINIQUE

This section describes the fresh water, waste, and bilge systems on your cruiser. Some models may also be equipped with a raw water system.

FRESH WATER SYSTEM

The fresh water system on your cruiser consists of a water tank, pump, water heater, and a distribution system. Fresh water is supplied to various areas including the galley, the head, and a transom shower. Some models have male hose connections for cockpit and foredeck washdown. **Figure 4.1** shows a typical fresh water system. Some components are optional equipment. Check with your dealer if you have a question about your cruiser's system.

FRESH WATER TANK

The fresh water system has a water tank in the aft section of the boat. The tank has a separate filler on the gunwale. A water tank vent is next to the fill plate.

To fill the fresh water tank:

1. Make sure the dockside water supply is suitable for drinking. *Not all dockside water is drinking water.* Check with the dockmaster if necessary.

2. Insert the filler cap key provided with your boat into the slot on the filler cap and turn counterclockwise to unlock. Remove the filler cap.

3. Using the hose from the dockside water supply, fill the tank until water flows out of the vent.

   Note: Garden hoses are not recommended for filling the tank. See your dealer for a sanitary drinking water hose.

4. Close the fill fitting.

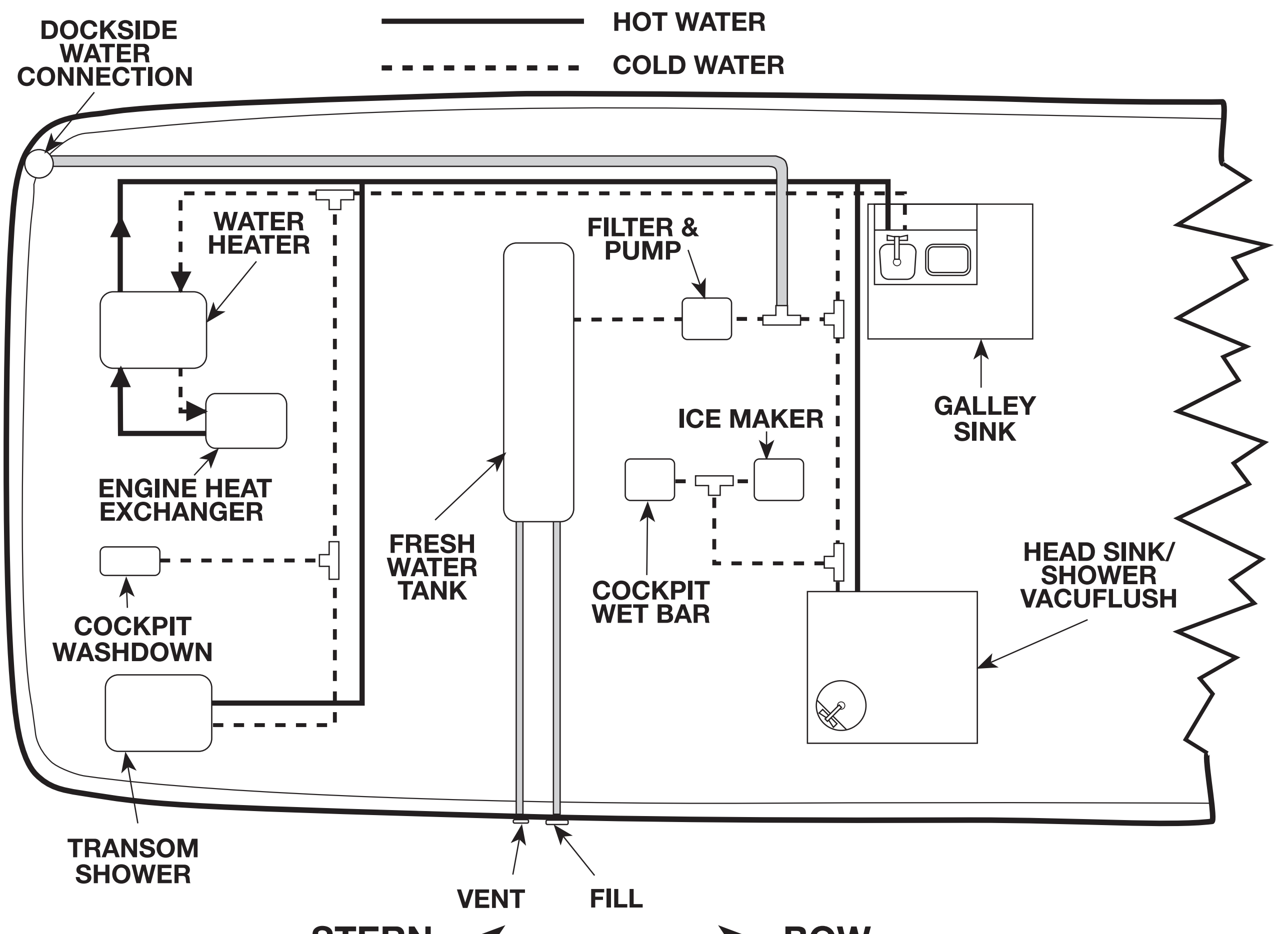


FIGURE 4.1 TYPICAL COMPLEX FRESHWATER SYSTEM

FRESH WATER PUMP

The fresh water pump supplies water under pressure to the system when the dockside water supply is not connected. The FRESH WATER PUMP breaker switch on the DC CONTROL panel controls its operation. The pump is under the engine hatch.

Before entering the pump, the water passes through a filter to capture any contaminants. When the breaker is switched to ON, the pump runs until the hot and cold water systems are pressurized. An automatic pressure switch shuts the pump off until the pressure drops to a preset level (for example, a pressure drop caused by opening a faucet). The pump will then run again until the system is pressurized and turn itself off.

If the pump runs from time to time even though no water is being used, a leak in a water line is a likely cause. Check all lines for a leak and repair.

Important: Operate the fresh water pump only when there is water in the tank. Running the pump dry will damage the impeller. The pump will not automatically turn off when the tank is empty. If the breaker switch is left on when the tank is empty, the pump may overheat.

INITIAL STARTUP

1. Fill the tank approximately 1/2 – 3/4 full. Section 3, Specifications, lists the capacity of the water tank on your cruiser.

2. Turn the FRESH WATER PUMP switch on.

3. Open each cold water faucet, beginning with the faucet furthest from the water tank, to let air escape. Close the faucet when the water flow becomes steady, and leave it closed.

4. Open a hot water faucet to fill the water heater and allow air to escape from the line. Close the faucet.

5. Open each hot water faucet, beginning with the faucet furthest from the water heater, to let air escape. Close the faucet when the water flow becomes steady, and leave it closed.

   The pump will run until the system is pressurized and then shut off.

6. Fill the tank to its capacity.

SANITIZING THE FRESH WATER SYSTEM

Before using your fresh water system for the first time or if you suspect the water system has been contaminated, do the following:

1. Drain the fresh water tank completely. Open all faucets, showers, and other outlets until the flow of water stops. *Shut off the fresh water pump as soon as the tank is empty.*

2. Mix a solution of 2 ounces household bleach to 1 gallon of water for every 15 gallons of tank capacity. Pour the solution into the fresh water tank.

3. Fill the tank with clean fresh water.

4. Turn the fresh water pump on and bleed air from all faucets, showers, and other outlets.

5. After 3 hours, drain the system completely.

6. Fill the tank with clean fresh water. Flush system by draining tank again.

7. Fill the tank with clean, fresh drinking water.

If you can smell or taste bleach in the water:

1. Drain the system completely.

2. Mix a solution of 1 quart white vinegar to 5 gallons of water. Pour the solution into the fresh water tank.

3. Allow the solution to remain in the tank until one hour of cruising time has been logged. The boat's motion will wash down the tank with the vinegar/water solution and neutralize the bleach.

4. Drain the fresh water system completely.

5. Flush the system with one full tank of water.

6. Fill the tank with clean fresh drinking water.

DOCKSIDE WATER HOOKUP

As an alternative to the fresh water tank, the system can be connected to a dockside water supply. Because the water enters the boat under pressure, it bypasses the fresh water tank, filter and pump. The pump should be shut off when the system is connected to dockside water.

NOTE: Using dockside water does not replenish water supply in your tank. The tank can only be filled at the fresh water fill plate.

The fresh water system operates at a lower pressure than that supplied from a dockside water source. Unless the pressure is regulated, dockside water may rupture lines or leak through gaskets. Monitor the water system carefully the first time you hook it up to the dockside water system because the system is connected to an unlimited supply of water. The dockside water inlet on your cruiser may be equipped with a pressure regulator to reduce the pressure of the water supplied to your boat's system. Check with your dealer if you have a question.

⚠ CAUTION

NEVER leave the boat unattended while using the dockside water hookup. If a line ruptures or other major leak develops, excess water in the bilge could damage the engines or other boat components, or — worse yet — the excess water could sink your boat. Turn the water supply off before leaving.

To connect dockside water:

1. Turn the FRESH WATER PUMP switch off.

⚠ WARNING

Before connecting to any water fitting be sure the water is potable and suitable for human consumption. Also, a special sanitary drinking water hose is required for the potable water connection. Do not use a common garden hose for drinking water.

2. Remove the threaded plug from the female swivel hose connector of the water inlet fitting. Be sure to clean both ends and flush the hose before connecting. Foreign matter may damage the pressure regulator.

3 Attach the proper sanitary drinking water hose to the water inlet fitting.

4. Before connecting the dockside water outlet, open the valve fully to flush away any rust particles which may be present.

5. Connect the hose to the dockside water outlet.

WATER HEATER

Your boat is equipped with a water heater to provide hot water to the fresh water system. A breaker marked WATER HEATER on the AC control panel controls the operation of the heater. The heater will not operate using DC power. Some models may have an adjustable thermostat to regulate hot water temperature. Check with your dealer for the capacity of the water heater.

Important: Before turning the water heater circuit breaker ON, make sure the water heater is full of water. Turning on power to an empty heater could damage the heating elements and make the water heater useless.

Follow these procedures to use the water heater:

1. Make sure the water heater is full of water by opening a hot water faucet until a steady stream of water flows out of the faucet and all air is removed from the hot water lines.

2. With the generator running or shore power connected to your boat, switch on the WATER HEATER circuit breaker at the AC CONTROL panel.

3. Wait for the water in the tank to heat up; then use as you would at home.

HEAT EXCHANGER

If your boat is equipped with a heat exchanger, heat from the engine is used to heat water in the heater. Water in the heater is heated whenever the engine is running. On twin engine boats, the heat exchanger is normally on the starboard engine.

⚠ WARNING

This water may be very hot, especially after the engines have been running for several hours. Be sure to check the temperature of the water before using water from the heater.

WATER SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Air in system	Water tank empty	Fill tank. With pump on, bleed air from lines by opening faucets until water flows out.
Fresh water pump cycles on and off	Leak in water system	Locate leak and repair.
No water at shower or sinks with faucets on	FRESH WATER PUMP breaker off	Switch breaker to ON.
	Water tank empty	Fill tank.
	Blocked or pinched water lines	Clear obstruction or straighten line.
	Loose electrical connections	Check connections; tighten as needed. See your dealer for service.
	Defective pump	See your dealer for service.
Low water pressure at all sinks and shower	Defective pump	See your dealer for service.
Low water pressure at one sink	Pinched water line	Straighten line.
Raw water pump not pumping water	Tripped circuit breaker	Reset if tripped.
	No water supply	Check for clogged pump. Remove material as needed. Check for clogged thru–hull fitting. Clean fitting.
	Loose electrical connections	Check and tighten connections. Make sure wires are not broken.

RAW WATER SYSTEM

A raw water system is provided as optional equipment on some models. The raw water pump switch is at the helm. The pump location varies by model. The raw water system has male hose connections for washing down the cockpit and foredeck. If the raw water hose nozzle is closed, the pump will stop working when the hose is pressurized and start working again when the nozzle is opened.

SEACOCKS

Your boat is equipped with seacocks to shut off openings below the water line in emergencies or when removing various components for repair. Close seacocks when your boat will be unattended for extended periods of time.

A sea strainer installed on the intake side of the water cooling system protects the system from clogging and provides an easy way to remove occasional debris **(Figure 4.2)**. Periodic inspection and removal of debris is essential for effective operation, but the frequency will vary depending on the amount of use and local conditions.

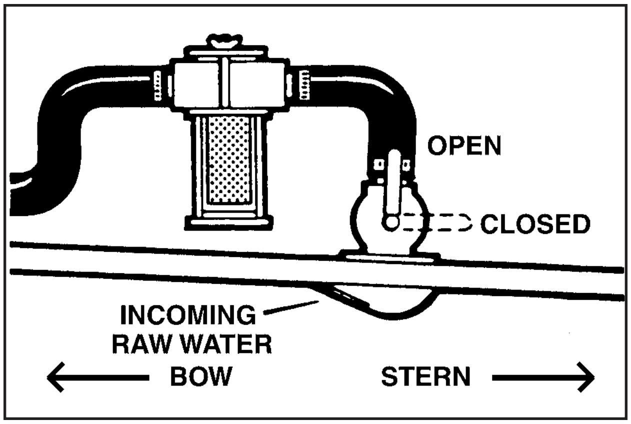


FIGURE 4.2 SEACOCK AND SEA STRAINER

WASTE SYSTEM

All waste system components are made of materials which prevent odor permeation and resist chemical actions. See manufacturer's manual before adding chemicals to your waste system.

VACUFLUSH® HEAD

If your boat is equipped with the VacuFlush head, your waste system is actuated by a HEAD or TOILET SYSTEM switch at the DC electrical panel. It uses fresh water to minimize odor problems. To add water to the bowl, raise flush lever until desired water level is reached. Add deodorizer before use the head. The pedal at the base of the head evacuates waste and a vacuum forces the waste to the holding tank. **Figure 4.3** is a diagram of a typical VacuFlush system.

To flush, press flush lever sharply to floor until contents clear bowl. A sharp popping noise is normal when the vacuum seal is broken. Hold flush lever down for three seconds. If flush lever is accidentally released before waste clears bowl, do not attempt to flush toilet again until vacuum pump stops running. A small amount of water should remain in the bowl after flushing. Do not dispose of sanitary napkins or other insoluble items in toilet.

Make sure all guests understand the operation of the VacuFlush system and that the instruction label is easy to read and in plain sight.

Refer to your VacuFlush manual for complete information about the operation of the system.

HOLDING TANK

Waste from the toilet is flushed to the holding tank. You can empty the holding tank using a dockside pumpout or, when permitted, through a macerator through hull fitting in the hull bottom.

> ⚠ **WARNING**
>
> **Waste in the holding tank can form methane, an explosive gas. Use suitable precautions when any maintenance is done to the sanitary system.**

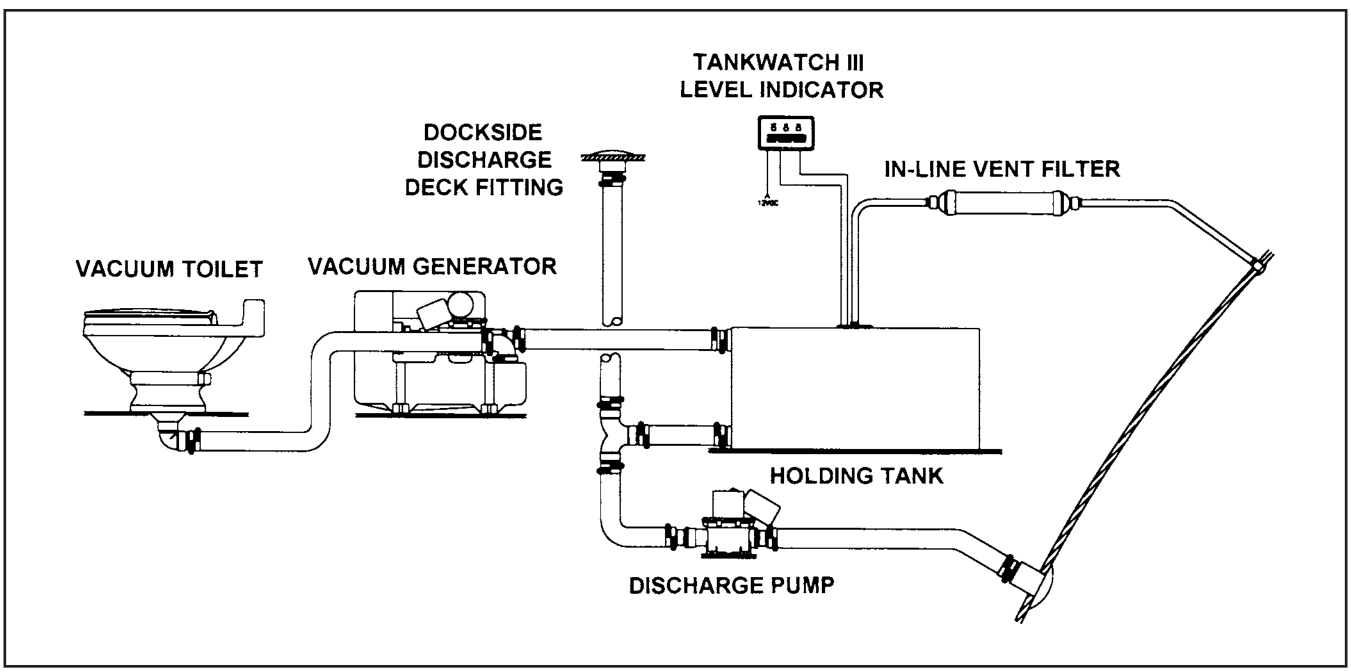


FIGURE 4.3 TYPICAL VACUFLUSH SYSTEM

The holding tank is equipped with a waste tank level indicator in the head compartment. Check this regularly to see how full the tank is. When the tank is full, **do not use the head**. If the tank is overfilled, waste can plug the vent or cause the tank to rupture, allowing its contents to empty into the bilge. Checking the level regularly is time well spent.

To empty the holding tank, Wellcraft recommends using a dockside pumpout facility. Connect the hose from the pumpout facility to the fitting marked WASTE on the starboard side deck.

When pumping out the holding tank, place the waste cap in a secure place. If you drop it into the water or it falls overboard, you will probably not be able to retrieve it. Consider keeping an extra cap on board in case you drop one overboard. Flush the head several times to clean waste buildup out of the lines and rinse out the tank.

Flushing fresh water through the head is also a good idea if you will be leaving the boat for two or more days. Doing so will clear all waste from the lines into the holding tank. Waste in the lines tends to dry out. These hardened wastes may affect future operation because they make the inside diameter of the hose smaller.

OVERBOARD DISCHARGE

IMPORTANT: Overboard discharge of untreated sewage within three miles of land is prohibited by law. Check with local authorities for proper discharge procedures in your area. If your boat is going to be used on inland waters, have your dealer seal the overboard discharge portion of your waste system.

If regulations permit, the macerator can be used to pump waste from the holding tank overboard. The MACERATOR circuit breaker switch at the DC Control panel controls the power supply to the macerator. The macerator pulls the waste from the holding tank, grinds the waste into small particles, and pumps the waste overboard through a hull discharge fitting above the water line.

Follow these procedures to operate the macerator:

1. Switch the MACERATOR breaker switch at the DC main electrical control panel to ON.

2. Allow the macerator to run until the holding tank is empty, but no longer. **Running the macerator when the tank is empty will cause damage to the pump**.

3. When you hear the pump speed up (indicates tank is empty), immediately switch the MACERATOR breaker to OFF.

BILGE SYSTEM

AUTOMATIC BILGE PUMP

Your cruiser is equipped with several bilge pumps. (The number of pumps will vary by model). The automatic bilge pumps remove water from the bilge area. Rising water activates a float switch to start the pump. When most of the water has been pumped out, the float switch shuts the pump off. The pump has a manual override. The pump can be turned on manually using the switch at the helm.

If for some reason the pump fails to start, check the fuse and wiring connections. If the pump motor runs but no water is discharged, it may be clogged. Keep the area around the switch and the pump free of debris. If there is no visible debris clogging the pump or blocking the float switch and water is still not being removed, inspect the discharge hose for kinks or obstruction.

Be kind to our environment. If oil or fuel is spilled in the bilge, do not run the pump. Keep the oil or fuel from spreading in the bilge and properly dispose of it on shore.

WASTE SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Head not flushing	Fresh water tank empty	Fill tank
Head not emptying	Blocked line to holding tank	Remove material from line.

BILGE BLOWER

> ⚠ **WARNING**
>
> **Turn on the bilge blower for at least 5 minutes before starting the engine to eliminate gasoline fumes in the bilge. Open the engine cover during that time and smell for fumes. DO NOT start engine if gasoline fumes are present. Do not operate blower while fueling boat.**

The bilge blower forces fumes out of the engine compartment area and circulates fresh air drawn in through the deck vents. *The deck vents must be kept clear and open at all times.* The blower must run at least five minutes before starting the engine. It must also be running during engine start-up and operation below cruising speed. At cruising speed, air flows into and out of engine compartment because of the boat's speed and the shape and placement of the vents.

FUEL SYSTEM COMPONENTS

The configuration of your boat's fuel system varies depending on the number and type of engines it has and whether it has an onboard generator.

FUEL TANKS

Single engine boats have one fuel tank. Twin engine boats have two tanks. The starboard tank supplies fuel to the starboard engine; the port tank, to the port engine. The port tank supplies fuel to the generator if provided. Each engine and the generator have separate fuel pickup tubes. An electrical sending unit inside the tanks provides an electrical signal to the fuel gauge at the helm to indicate the fuel level amount in the tank. The gauge is marked in 1/4 tank increments.

The fuel fill fittings for the tanks are on the port and starboard sides. The fill fitting is marked GAS (gasoline engines) or DIESEL (diesel engines). The fuel vent is near the top of the hull. See Section 10 for fueling instructions and recommendations.

FUEL MANIFOLD

Note: This section provides general information about the fuel manifold. See your dealer for more detailed information.

Boats with twin engines have twin fuel tanks and a fuel manifold. The fuel manifold has a crossover valve which allows the operator to run both engines off of either fuel tank. In normal operation, the crossover valve is closed. With both in–line valves open, the engines will be fueled by individual tanks. To supply both engines from the port tank, open the crossover valve and close the in–line valve from the starboard fuel tank. To fuel both engines from the starboard tank, open the crossover valve and close the inline valve from the port fuel tank.

If your boat has diesel engines, a fuel return line is also connected to the manifold.

FUEL SHUTOFF VALVES

If your boat has one engine, the fuel supply line has a shutoff valve in the engine room on top of the fuel tank. Turning the handle so it is perpendicular to the valve body shuts off the fuel supply as shown on **Figure 5.1.** Turning the handle so it is in–line with the valve body opens the valve. The fuel system on twin engine boats does not have fuel shutoff valves.

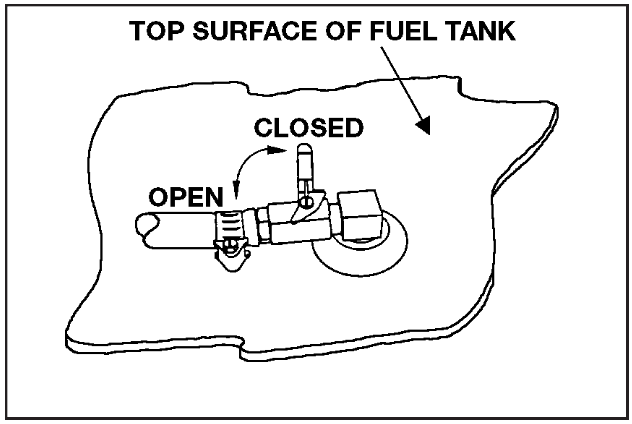


FIGURE 5.1 FUEL SHUTOFF VALVE (SINGLE ENGINE BOATS ONLY)

FUEL FILTERS

Each gasoline engine has a separate fuel filter mounted on the engine. The generator has a filter and a remote–mounted valve. The filters have replaceable filter elements.

Boats equipped with diesel engines also have water separating fuel filters in the engine compartment. These filters should be checked regularly. Remove the wing nut on the fuel filter to remove the bowl and empty the water.

FUEL SYSTEM TROUBLESHOOTING

PROBLEM	*CAUSE*	*SOLUTION*
Fuel overflows at fill plate (tank not full)	Fill or vent line blocked	Check lines. Clear obstruction from line or straighten line if kinked.
Water or moisture in fuel tank	Cap on deck fuel fill plate not tight	Check cap; tighten.
	Condensation forming on walls of partially filled tank	Gasoline engines: Add fuel drying product to fuel supply. See your dealer for recommendations.
		Diesel engines: Check fuel/water separators; drain if necessary. Check with your dealer.
	Poor quality fuel from marina tanks	Follow remedies for "Condensation" above. If remedies fail to correct problem, fuel tank and lines may need to be drained and flushed. See your dealer for service.
Engine cranks but will not start (fuel system)	Lack of fuel	Clean fuel filter, check fuel level; check whether anti–siphon valve, if so equipped, is stuck shut.
		Improper starting procedure Review starting procedures in engine manual.
	Clogged fuel filter	Check and replace fuel filter element.
	No fuel reaching engine with all fuel valves open.	Check fuel pump, fuel pump filter, carburetor fuel filter, and fuel tank line for cracked flanges or restricted fittings.
	Contaminated fuel	Inspect for water or other contaminants in fuel. If contaminated, drain tank and flush with fresh fuel.

This section of the manual includes information about your boats AC and DC electrical systems and components. Please note that this manual does not designate equipment as standard or optional. Some equipment is not available on some models. Have all service performed by a professional electrician. See your dealer for electrical schematics or if you have any other questions.

WIRING COLOR CODE

The American Boat and Yacht Council (ABYC) has published a standard for color coding of boat wiring. We voluntarily comply with this standard to simplify installing new equipment or troubleshooting the electrical system. Here is the color code system:

RED wire is used for the positive (+) side of the battery in DC systems on wires that go to fuses or circuit breakers, to distribution panels and high-draw equipment (engine starters), start ignition switches and to meters.

YELLOW WITH RED STRIPE wire is used on one circuit only; from the starter switch to the starter solenoid.

NOTE: There are 10 basic colors and color combinations for different circuits used beyond the ignition switch. Some of these colors, however, can serve more than one type of circuit. For example, they can be used in engine and non-engine circuits.

YELLOW wire is used for the power lead to the bilge blower from a fuse or switch. It is also the color used for the wire from the generator or alternator field terminal to the field terminal on the voltage regulator.

DARK GRAY wire is used for navigation lights and wire between the fuse or the fuse and the lights. It is also the color used for the sensor wire from the tachometer sender to the gauge.

BROWN wire is used for leads to the bilge pumps from fuses or switches.

PURPLE wire is used between the ignition switch and the coil and from the ignition switch to electrical instruments through the distribution panel.

DARK BLUE wire is used for instrument and cabin lights. These wires run from switches or fuses to the lights.

LIGHT BLUE wire is used for the sensor wire from the engine oil pressure sender to the oil pressure gauge. The pressure sensor most likely will be three wires — a light blue wire from the sender, a black negative wire to the ground or return and a purple hot wire from the switch or fuse.

TAN wire is used for the wire from the water temperature sender to its gauge.

PINK wire is used for the sensor wire from the fuel tank's sender to the fuel gauge.

GREEN wire is used for bonding wires and normally does not carry current.

The table on the following page lists fuses and circuit breakers on your boat. The location of breaker panels varies by boat model. The breaker panel is usually at the helm or in the engine room. Check with your dealer if you cannot find the panel. Your boat will not have all the fuses and breakers listed.

12-VOLT DC ELECTRICAL SYSTEM

⚠ WARNING

Considerable care has been taken to design a safe electrical system to protect you from hazardous shocks. To protect from hazardous electric shock, always have a qualified technician make any modifications to the system.

Your boat's 12-volt DC system obtains its power from a battery. An engine-driven alternator charges the battery whenever the engine is running. An automatic battery charger keeps the battery charged whenever your boat is connected to shore power. The voltmeter on the electrical load center indicates the charging level of the battery.

The electrical system ground is GROUNDED by grounding the batteries to the engine(s). The auxiliary batteries (if so equipped) are in turn

Equipment	Wire Color	Circuit Breaker or Fuse (amps)
Accessory Feed	Orange	as required
Alarm	Tan-Blue	**
Anchor Light	Gray-Blue	5
Anchor Windlass		**
Auto Bilge Aft		10
Auto Bilge Fwd		10
Auto Pilot		20
Battery Parallel		5
Bilge Pump Manual	Brown	*
Bilge Pump Auto	Brown-Red	**
Blower	Yellow	**
Cabin Lights	Blue	10
Courtesy Lights		5
Depth Finder		3
Electronics		50
Engine Room Hatch Motor		20
Engine Room Lights		5
Fuel	Pink	5
Gauge	Purple	***
Helm Main Power		50
High Water Pump		10
Horn	Yellow	**
Ignition	Purple	**
Key Switch	Orange	***
Lights		5
Livewell		10
Navigation/Anchor		10
Navigation Light	Gray	5
Oil Pressure	Light Blue	***
Oil Temperature	Tan-Black	none
Panel Lights	Blue	5
Port Ignition		20
Port Wiper	White-Black	5
Power Trim	Purple-White	20
Raw Water		10
Starboard Wiper	White	5
Solenoid	Yellow-Red	***
Start Switch	Purple	***
Tachometer	Gray	***
Transom Hatch Motor		20
Trim Tabs		20
Water Temperature	Tan	***
Stereo	Blue	**
Stereo Memory	Red	2
VHF		10
Winch		10
Windlass		10.5
Wiper		**
Grounds	Black	none
Battery and Main Feed	Red	**

* Rule 500 or equal — 7.5 amps

** Indicates fuse determined by model

*** Fused off ignition

grounded to the cranking batteries. The engines are connected by a ground cable for added assurance of proper grounding. The engines are then grounded to a bonding strip in the engine compartment. This type of negative ground system is the approved system for marine DC electrical systems. If additional equipment is to be installed, it must be adaptable to the negative ground system. When installing additional equipment, ensure that each item's current supply is taken from the main DC distribution panel. This service should be performed only by your dealer. All required additional circuit protection must also be added at the DC distribution panel.

The DC switch breakers allow you to interrupt or enable a circuit and they also protect the system by shutting down power if a short circuit or an overload occurs.

NOTE: Power feeds for accessory equipment must NOT be taken from the voltmeter terminals.

BATTERIES

> ⚠ **WARNING**
>
> **POISON! Batteries contain sulfuric acid which can cause severe burns. Avoid contact with skin, eyes or clothing. Wear goggles, rubber gloves and protective apron when working with a battery. In case of contact, flush with water at least 15 minutes. If swallowed, drink large quantities of water or milk. Follow with Milk of Magnesia, beaten egg or vegetable oil. Get medical attention immediately.**

Your dealer has installed batteries which supply power to the DC electrical system components. Check with your dealer if you have questions about battery capacity. Marine batteries provide high reserve capacity plus cold cranking performance. When the engine is running, the battery is charged automatically. If your boat has twin engines, the starboard battery is the "house" battery, the one that powers any DC equipment on your boat.

Batteries produce hydrogen and oxygen gases when being charged. These explosive gases escape through the vent/fill caps and may form an explosive atmosphere around the battery if ventilation is poor. This gas may remain around the battery for several hours after charging. Sparks or flames can ignite the gas and cause an explosion.

BATTERY PARALLELING SWITCH

On some boats with twin engines, you can use the battery paralleling switch to start one engine using both batteries. Use this switch to start an engine if either battery does not have sufficient power to start the engine because of a low charge level. The switch is at the helm.

BATTERY CHARGER

The boat's batteries are normally charged whenever the engines are running. If you are docked for an extended period of time, operating DC devices and equipment will drain the power from the batteries. Unless the batteries are kept charged, they may not have enough power to start the engines when you need them.

If your boat is equipped with a battery charger, it will automatically charge the batteries when your boat is connected to shore power or when the generator is running and the BATTERY CHARGER breaker at the AC CONTROL panel is switched to ON.

Leaving the battery charger switch on whenever AC power is available is a good idea. It will keep the batteries fully charged. After the batteries are recharged, it provides a maintenance or trickle charge as needed.

ALTERNATORS

The engine alternators will recharge the batteries while the engines are running. Voltage regulators control the rate of charge by sensing voltage variations and increase or decrease output accordingly.

OVERLOAD PROTECTION

The engine is equipped with a circuit breaker to protect the engine wiring harness and instrumentation power leads. If an electrical overload occurs, a circuit breaker will open and interrupt current flow when the circuit draw exceeds the rated amperage. Refer to your engine owner's manual for location and resetting procedure.

DUAL BATTERY SWITCH

The dual battery switch enables DC power to be used from one or two batteries. It controls power to the engine and all 12-volt electrical equipment, except the automatic bilge pump

and the stereo memory. The settings available are OFF, 1, 2 and ALL. We recommend using only one battery at a time by using the number one (1) or two (2) setting. Avoid using the ALL setting unless a single battery is not sufficient to start the engine.

IMPORTANT: The dual battery switch should be in the OFF setting when the boat is not in use and especially while the boat is unattended.

> ⚠ **DANGER**
>
> **Do not turn dual battery switch to OFF setting while engine is running. The alternator and electrical wiring may be damaged.**

While in the OFF setting, only the automatic bilge pump and stereo presets are supplied with DC power. All other electrical items are OFF.

The description and function for each of the settings on the dual battery switch is described below:

- OFF: All 12-volt power to boat is shut OFF except for the automatic bilge pump and stereo presets. When boat is unattended for extended periods of time, turn the dual battery switch to the OFF position.
- Setting one (1) will use battery #1 to power engine and all 12-volt equipment. Battery #2 is isolated and remains in reserve. Battery #1 is charged by the alternator.
- Setting two (2) uses battery #2. Except for bilge pump, battery #1 is isolated and remains in reserve. Battery #2 is charged by the alternator.
- Setting ALL will use both batteries. Both batteries are used by the engine and all 12-volt equipment and are charged by the alternator when the engine is running.

NOTE: Rotating battery usage will increase battery longevity.

Some twin engine models will have two dual battery switches, one for each engine and battery. The port side switch should be in position number one (1) and the starboard side switch should be in position number two (2) when starting the engines.

If you can't start an engine because the battery is low, try starting the other engine. Once the second engine is running, turn both battery switches to all, and then start the first engine using both batteries. Once the first engine is running, return both battery switches to the preferred setting.

AC ELECTRICAL SYSTEM

Your boat has been equipped with an AC electrical system which meets or exceeds national standards at the time it was built. To work, your boat's AC system must be connected to a shore power supply or the generator.

Dockside power service is available in 110 volt or 220 volt configurations. In North American and Pacific Rim countries, the standard power supply is 110 V, 60 hertz (Hz). However, in some European countries, the standard power supply is 220 V, 50 Hz.

The main AC breaker(s) on your boat turns your entire AC system on and off, allowing you to check for proper voltage and polarity immediately after a shore power connection has been made and before individual circuits are enabled. These switches have an LED indicator to indicate when they are on. Most panels also have a transfer switch which allows you to operate some functions on the second load panel from the first load panel.

TRANSFER SWITCH

The transfer switch can be used to temporarily run equipment from AC Load Group 2 off of the shore power cord for AC Load Group 1. With a shore power cord attached to AC power hookup #1 flip the transfer switch to be able to run selected equipment from Load Group 2. Be careful not to exceed 30 amps on one power cord. The table on page 6–7 lists the amperage drawn by AC components.

NOTE: Exceeding 30 amps on one power cord will cause the main service breaker to trip. If the main breaker trips, shut off equipment to reduce the load before resetting the main service breaker.

SHORE POWER

> ⚠ **DANGER**
>
> **To prevent damage to electrical system, never operate shore power system at less than 105 volts.**

Your boat has a single male receptacle outside on the deck for shore power connection (two receptacles if you have air conditioning).

Before you connect your boat to shore power, turn off the main cabin circuit breakers. Attach the shore power cord to the boat first and turn clockwise to lock. Thread the locking ring on the cord to secure it to the receptacle. Connecting the cord to the boat first will prevent dropping a "hot" cord into the water. (When you leave the dock, remove the cord from the dockside shore outlet first.) If you have any questions, contact your dealer.

Make sure the dockside shore power breaker is OFF; then plug in the cord. Turn the dockside shore power breaker on. Immediately check the polarity lights on the main electrical panel in the boat. If the REVERSED POLARITY light on the panel illuminates, **do not turn on the main cabin breaker**. Turn off the dockside shore power breaker and disconnect your shore power cord. Inform the marina manager of the problem. If you have any questions, contact your dealer.

Important: Some equipment will not work or may be damaged if polarity is reversed. Damage caused by reversed polarity is not covered under your warranty. Be sure polarity is correct when you connect your boat to shore power.

Note: Reversed polarity occurs only with 110 V systems. It is not a concern for boats having 220 V systems.

An AC circuit may overload if the current draw (amperage) of the accessories in use exceeds the capacity of the load group. For each load group, an AC amp indicator in the main electrical panel indicates the amperage draw. If a circuit overloads, turning off one or more accessories may be necessary while you operate another.

GENERATOR

The optional onboard generator provides AC power to your boat's electrical system. If your boat has a generator, it is mounted in the engine compartment.

Accidental starting of the generator can cause severe personal injury or death. Stop generator and disable by disconnecting battery cables (negative [–] cable first) when maintenance or repairs are made to the engine, controls, or generator. Do not disconnect cables if gas fumes are present.

Note: Follow all generator instructions in the operator's manual. The manual includes detailed information on specifications and procedures for safe operation, maintenance, and winterizing. It also explains how you can obtain service for the generator, if required. The manual is in your owner's packet.

Follow these procedures to operate the generator:

1. Run bilge blower for five minutes before starting generator. Run blower while generator is operating.

2. Make sure seawater intake valve (seacock) for the generator is open. Seacock must remain open at all times when generator is operating. Seawater strainer must be free of debris to prevent clogging intake. Inspect seawater strainer frequently.

   Note: Wellcraft recommends not using the generator when underway. When underway and not using the generator, the seacock should be closed.

3. Press or toggle START switch on main panel in cabin. When starting generator, never operate starter for more than 30 seconds. Wait at least 30 seconds before each attempted start.

   On the generator in the engine compartment are a choke and starter switch. If starting the generator from the cabin is difficult, use the choke and starter on the generator.

4. Look over side of boat and check for water flowing from discharge port. If water is not flowing, stop the generator. Check for the following: blocked water intake, air in line, clogged sea strainer, or closed sea cock that should be open. Correct the problem before restarting the generator.

5. Before stopping, run generator at no load for three to five minutes to allow lubricating oil and engine cooling water to carry heat away from combustion chamber.

GFCI OUTLET

One outlet on board your boat has been equipped with ground fault circuit interrupter. This outlet has been designed to protect your passengers and equipment from the damage caused by ground faults. There are two buttons in between the two receptacles on the outlet. To test the ground fault interrupter, press the test button. If the reset button pops out, the outlet is working properly. If the outlet is not working properly, have your electrical system checked by a qualified electrician.

You will have to press the reset button back in for your AC electrical equipment to work. If the reset button pops out at any time other than when you are testing the system, you have a ground fault and should have your system checked as soon as possible.

MAIN ELECTRICAL PANEL

The main electrical panel is below deck in the cabin or companionway. The location varies by boat model. This panel is the electrical heart of your boat. At this panel are the switches which

Switch	Amps	Component Powered
12V Outlets	15	DC outlets in the cabin
Accessory	5	Optional equipment wired to this switch
Battery Test	N/A	Power supply in batteries (DC volts and amperes indicated on gauges at main electrical panel)
Blower	N/A	Bilge blower
Cabin Lights	10, 15	Lights in the cabin
Courtesy Lights	10, 25	Cockpit lighting
DC Main Breaker	40, 50	DC portion of electrical panel
Galley lights	10	Lights in the galley
Head	10, 15, 25	Light in head
Lavatory Accessories	15, 20	DC accessory outlet in the head
Macerator	20	Holding tank overboard discharge (macerator)
Refrigerator	10	Refrigerator on DC power
Salon Lights	10	Lights in the salon
Stereo	5, 10	Stereo system (There is also an ON/OFF switch located on the stereo.)
Toilet System	15	VacuFlush system
TV Antenna	25	TV antenna
Water Pressure	10	Fresh water pump
Stereo	10	Stereo system (There is also an ON/OFF switch located on the stereo.)

supply power to the components which operate using AC and DC power.

DC BREAKERS AND SWITCHES

The number and type of DC switches and breakers at the main electrical panel varies by model as do the identification tags and the ratings of the breakers. Switches and breakers are listed below in alphabetical order.

Switch	Amps	Component Powered
Accessories	5	Circuit available for installation of owner–supplied equipment
Air Conditioner	20, 30	Air conditioner
Battery Charger	5	Battery charger
Cabin Lights	10	Lights in the cabin
Coffee Maker	5, 15	Coffee maker
Converter	10	Battery charger
Food Center	15	Galley
Head	15	Lights and AC outlets in head
Hot Water	15	Water heater
Icemaker	15	Ice maker
Microwave	5	Microwave
Outlets Port	15	Outlets on port side of cabin
Outlets Starboard	15	Outlets on starboard side of cabin
Range	20	Stove in galley
Refrigerator	2.5, 5, 10	Refrigerator on AC power
Stove	10	Stove in galley
Toilet System	15	VacuFlush system
TV	15	TV
Water Heater	20	Water heater
The generator, if provided, has toggle switches at the main electrical panel:		
Blower		Ventilate the generator room
Preheat		Preheat fuel supply (diesel only)
Start		Start the generator
Stop		Turn the generator off

AC BREAKERS AND SWITCHES

The number and type of AC switches and breakers at the main electrical panel varies by model as do the identification tags and the ratings of the breakers. Switches and breakers are listed below in alphabetical order.

AC panels have gauges indicating voltage of AC power supply and amperage drawn by AC components and accessories.

NOTE: If the transfer switch is activated, the electrical load can exceed the capacity of a single 30 amp power cord. Exceeding 30 amps will cause the main service breaker to trip. If the main breaker trips, shut off equipment to reduce the load before resetting the main service breaker.

HELM SWITCHES

The number and type of switches and breakers at the helm varies by model as do the identification tags and the ratings of the breakers. Switches and breakers are listed below in alphabetical order.

GALVANIC CORROSION

Corrosion of metal parts, especially those submerged in salt water, is a common problem for boat owners. Corrosion is caused by stray electric currents from shore stations supplying AC current, improperly grounded AC lines and circuits, and poorly insulated DC–powered equipment from boats moored nearby.

Zinc anodes have been installed either on your boat's sterndrives or, on inboard powered boats, on the transom. These anodes will corrode before any other submerged metal parts. Consult your dealer for their exact location. Whenever your boat is hauled out of the water, have your anodes inspected and replaced if necessary. Do not paint over zinc anodes. If new anodes are installed in spring, be sure to inspect them again in late summer, especially if you have done a lot of cruising to other marinas.

Use only Wellcraft replacement parts. When adding accessories not supplied by Wellcraft, consult your dealer regarding proper selection and installation.

Switch	**Function**
Accessory	Supplies power to any customer supplied equipment
Anchor Winch	Raises or drops anchor (3–position toggle switch, defaults to off)
Aft Bilge	Operates aft bilge pump
Anchor Lights	Turn anchor lights on or off
Battery Parallel	Allows use of both batteries
Bilge	Operate bilge pump(s) manually
Blower	Supplies power to bilge blowers
Cockpit Lights	Turn cockpit lights on or off
Courtesy	Turn courtesy lights on or off
Depth	Controls power to depth finder, if so equipped
Dimmer	Controls brightness of dash lights
Dock Lights	Turn dock lights on or off
Engine Room Lights	Turn lights in engine room on or off

BONDING

Your boat is fitted with a bonding system to minimize corrosion. This system involves the connection of all underwater fittings and hardware by individual jumper wires which are then connected to the engine's common ground point.

⚠ **DANGER**

Alteration of the bonding system can void your boat owner's warranty.

Switch	Function
Forward Bilge	Operate forward bilge pump
High Water	Turns on high water bilge pump
Horn	Operate horn
Livewell	Operates livewell pump
Mid Wiper	Operates middle windshield wiper
Navigation/ Anchor Lights	Turn navigation or anchor lights on or off (3–position toggle switch defaults to neutral center position)
Panel Lights	Turn helm panel lights on or off
Port Wiper	Turn port windshield wiper on or off
Raw Water	Operates your boat's raw water pump
Safety Switch	Shuts down engine(s) if operator is thrown from helm (lanyard connects to switch and operator)
Spreader Lights	Turns lights on radar arch on or off
Starboard Wiper	Turn starboard windshield wiper on or off
Trailer	Raises stern drive all the way up when boat is being trailered or beached. Do not use this switch when engine is running.
Windlass	Operates your boat's power windlass, if so equipped (3–position toggle switch defaults to neutral center position)
Wiper	Turns windshield wiper on or off

TROUBLESHOOTING CHART

DC ELECTRICAL SYSTEM

PROBLEM	CAUSE	SOLUTION
12 V equipment not working	Battery selector switch turned to OFF Weak or dead battery	Turn selector switch ON for starboard (2) battery. Recharge battery.
Battery not charging (engine running)	Engine alternator belt loose	Tighten belt.
Battery not holding a charge	Bad battery	Replace battery.
12 V device not working	Circuit breaker for device is OFF Weak or dead battery Faulty electrical connection Weak or dead battery Light bulb burned out	Switch breaker to ON. Change battery selector switch position; recharge battery. Check 12 V connections. Tighten or repair as needed. Change battery selector switch position; recharge battery. Replace bulb.

AC ELECTRICAL SYSTEM

PROBLEM	CAUSE	SOLUTION
No AC power	Main breaker(s) in engine compartment tripped or off Breaker(s) at AC CONTROL panel tripped or off Shore power cord not connected Loose or disconnected wire	Turn breakers on or reset. Turn breakers on or reset. Check cord; plug in if necessary. Tighten connections. See your dealer.
No power to AC devices	Breaker(s) at AC CONTROL panel tripped or off Shore power cord not connected	Turn breakers on or reset. Check cord; plug in if necessary.

AC ELECTRICAL SYSTEM TROUBLESHOOTING

No power to AC devices (Continued)	Loose or disconnected wire	Tighten connections. See your dealer.
Inadequate power to AC devices (generator running)	Electrical demand greater than generator output	Switch off devices and equipment not needed.
No power at AC outlets	Outlet breakers in AC CONTROL panel OFF	Switch breakers to ON.
	Ground fault interrupter tripped	Reset button on outlet and test.

This section covers the appliances found in the galley, the air conditioning system, the stereo system and the TV. Power is supplied to many of these components through a breaker switch in the main electrical panel.

STOVE

ALCOHOL/ELECTRIC

⚠ WARNING

Alcohol flame can not be seen in direct sunlight. Fueling an ignited burner can cause it to flare up. Do not light burner unless flame is extinguished and burner is cool.

⚠ WARNING

Use only manufacturer approved fuel. Always provide adequate ventilation when using an open flame. Do not use stove near fuel fill or fuel vent.

Your boat may be equipped with an alcohol/electric stove. See the manufacturer's manual for more information on use and maintenance.

ELECTRIC

Your boat may be equipped with an electric stove. This stove can only be operated when your boat is connected to shore power or when the generator is running. Refer to the stove owner's manual for details about using this appliance safely.

REFRIGERATOR

The refrigerator supplied with your boat operates off DC power from the battery or AC power through the main electrical panel. Switch the DC breaker for the refrigerator to ON to power the refrigerator from the battery. Using DC power to cool the interior of a warm refrigerator will take longer than cooling it with AC power.

Important: The refrigerator can drain the power from a battery in a short time, particularly if other devices are powered from the DC power supply. Operate the engines from time to time to recharge the batteries if an AC power supply is not available. See the refrigerator manual for more information.

OVEN

Your boat may have a microwave oven or a convection/microwave oven. The operation of either unit is similar.

The microwave oven is controlled by an electronic touch control panel on the oven. The controls for the convection oven are on the oven. The MICROWAVE or FOOD CENTER breaker at the main panel must be on to use the oven. For a detailed description of oven features, see the owner's manual supplied by the manufacturer.

⚠ CAUTION

To reduce the risk of burns, electric shock, fire, injury to persons or exposure to excessive microwave energy, read ALL instructions before using the microwave oven. Be sure to secure turntable while underway to prevent damage to the unit.

COFFEE MAKER

Your boat may be equipped with a coffee maker. See the equipment manufacturer's manual for information operation and maintenance.

MARINE STEREO

This unit is a highly sensitive electronic tuning AM/FM stereo receiver with an optional CD player. It employs several electronic circuits especially designed for superb radio reception on both AM and FM bands. Your boat has waterproof marine stereo speakers. The number of speakers and their location may vary on each model. See the stereo owner's manual for a complete list of features and instructions.

AIR CONDITIONING SYSTEM

Your boat may have an optional air conditioning system. **Figure 7.1** shows the components of a typical air conditioning system.

The air conditioning pump draws in sea water through a seacock in the bilge when the air conditioner is running. It discharges this through a thru–hull fitting above the water line. The locator drawings in Section 3 show the location of air conditioning system components on your boat. Air conditioning units are controlled through breaker switches at the AC control panel. When using an air conditioner, its breaker switch must be on.

When you operate the air conditioner:

1. Open the air conditioner seacock. The valve is open when the handle is in line with the hose.

2. Check the sea strainer next to the seacock. Clean it if necessary to assure a steady flow of water to the unit.

3. Set the thermostat to the temperature desired.

Important: Be sure to close air conditioner seacock when air conditioner is not in use.

The heat pump on the air conditioner can be used to heat the cabin. The heat pump runs in reverse and extracts heat from sea water to heat your boat. Using the heat pump feature

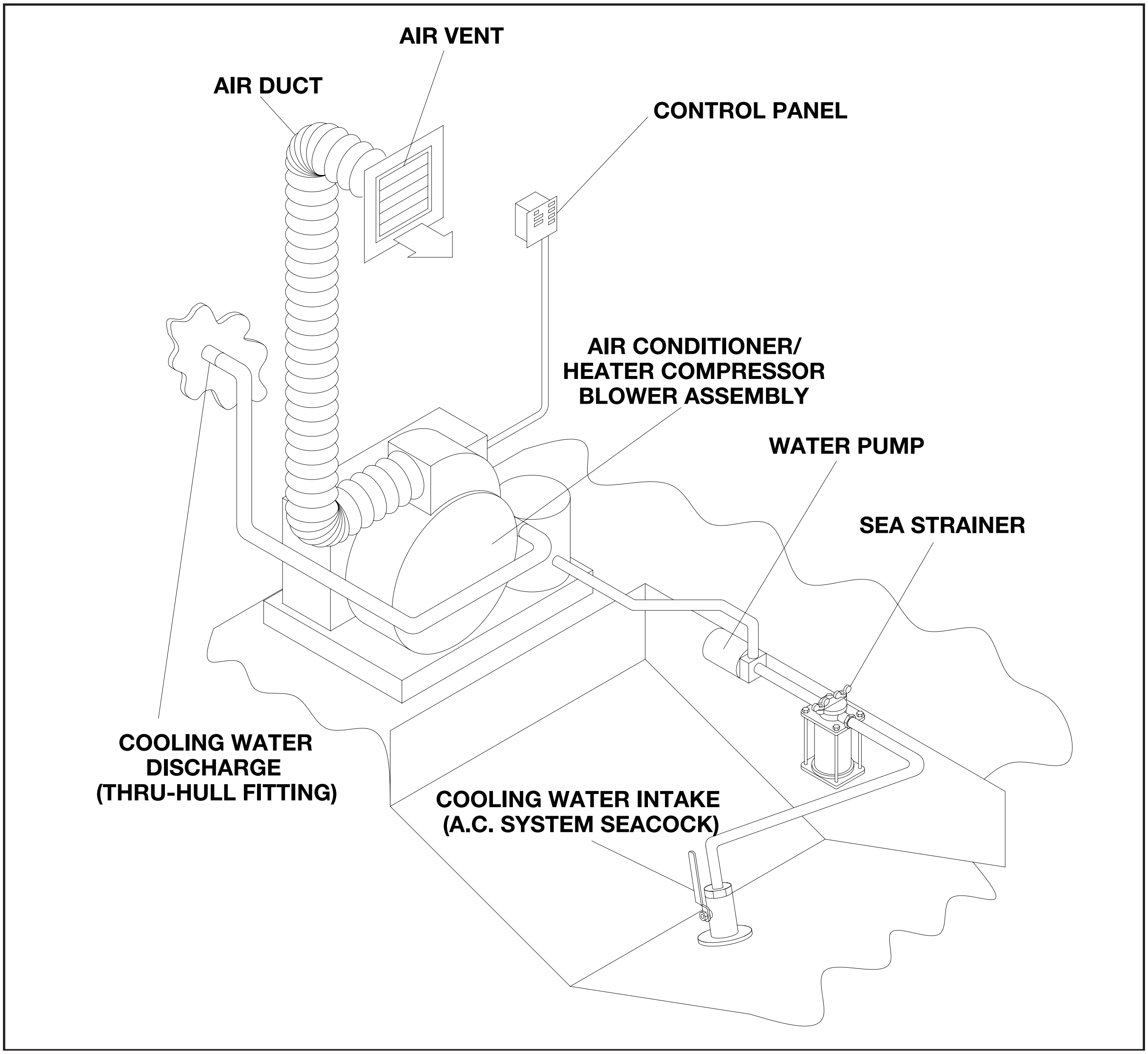


FIGURE 7.1 TYPICAL AC SYSTEM

when the sea water temperature is below 40° can damage the air conditioning system.

Refer to the manual furnished with the air conditioning unit for more detailed information regarding its operation.

AUTOMATIC FIRE SUPPRESSION SYSTEM

Your boat may be equipped with an automatic fire suppression system in the engine compartment. This system uses a fire extinguishing agent. A heat–sensitive automatic nozzle releases the agent as a vapor, cutting off the supply of oxygen to the fire. The system's indicator light is illuminated when the system is fully charged. When the system is discharged, the indicator light will go out. The light is on the dash or a separate monitoring panel, depending on boat model.

> ⚠ **WARNING**
>
> **If system discharges, immediately turn OFF engine, bilge blower(s), and electrical systems. Extinguish all smoking materials. Do not open engine compartment. Fresh air supplies oxygen to fire and fire may flash back through opening.**

If the system discharges, do not open engine compartment for at least 15 minutes. Hot metals or fuel can also begin cooling during this time. Cautiously inspect compartment for cause of fire and damage to equipment. Have portable extinguishers readily available. *Do not breathe fire caused fumes or vapors*.

Note: The fire suppression agent is an ozone–depleting substance. In order to help safeguard the environment, following the manufacturer's maintenance recommendations is important. Be sure to check the equipment manual for detailed information about safety precautions and procedures for operating and maintaining the fire suppression system.

TV/VCR (OPTIONAL)

Your boat may be equipped with a television set or TV/VCR combination. See the manufacturer's manual for information on operation and maintenance.

VHF RADIO

Your boat may be equipped with a VHF radio. See the manufacturer's manual for information on operation and maintenance.

This section discusses your boat's propulsion equipment. Depending on boat model, your boat is powered either by inboard engines through a transmission or by sterndrive(s). If your boat has a sterndrive, the manufacturer's manual provides detailed information about its operation.

Note: The information in this section, except for troubleshooting, trim tabs, and propellers applies primarily to inboard–powered boats.

PROPELLERS

The propellers supplied with your boat have been selected as the best propeller for average use. Consider keeping an extra set of propellers on your boat. If the propellers become damaged, you can replace them with the spares and continue your outing. Check with your dealer if you want to purchase an extra set.

Note: You, as owner, can change propeller sizes to suit other conditions. However, you assume all responsibility for any damage caused by the change in propeller size.

PROPELLER SHAFT

The propeller shaft is made of stainless steel which has excellent corrosion resistance and very high strength. The coupling at one end of the shaft is bolted to the transmission. The other end of the shaft is tapered, threaded, and keyed for installation of the propeller.

STRUTS

Each propeller shaft is supported by struts fastened to the bottom of the hull. The struts have replaceable bearings to minimize wear and to protect the shaft at the points where it passes through the strut hubs. Strut bearings should be lubricated by your dealer.

SHAFT LOG AND STUFFING BOX

The shaft log is a bronze tube inserted in an opening in the bottom of the boat for the propeller shaft. A short length of flexible hose connects the shaft stuffing box to the shaft log.

The stuffing box keeps water from leaking around the shaft into the boat. The stuffing box has a packing gland filled with waxed flax or synthetic fiber rings compressed around the shaft by the packing retainer.

A very slight leak helps lubricate the packing. One drop every 60 seconds is desirable. More than one drop per minute indicates wear caused by the rotating shaft. Tightening the packing retainer slightly will usually stop excessive leakage. If the leakage continues after tightening the retainer, the packing may need replacement, the log may be out of alignment, or the shaft may be bent or scored. Have your dealer check any persistent excess leakage.

Important: Overtightening the packing retainer may score the propeller shaft.

ALIGNMENT

Aligning the engine with the propeller shaft is critical for smooth operation of your boat. The shafts are properly aligned at the factory. Check the alignment after delivery or an extended lay–up. A slight misalignment can result in a loss of power, vibration, or wear in the bearings.

To check the alignment:

1. Remove the coupling bolts and spread the couplings very slightly.

2. Use a feeler gauge to measure the space between the couplings at the edges of the coupling. The difference in reading should not exceed 0.003 inch.

3. A second check is to leave the flange on the engine fixed and rotate the propeller shaft coupling in 90° steps. Check the clearance between the fixed engine flange and the rotating propeller flange with the feeler gauge at the top. If the four measurements differ by more than 0.003 inch, it may be an indication that there is a slight bend in the propeller shaft. This is an important check after striking a submerged object.

4. The straightness of the shaft can be further checked with the boat out of the water by setting up a dial indicator on a solid fixed surface and rotating the propeller shaft by hand (use the blades of the propeller to turn the shaft by hand. This test will clearly indicate whether the propeller shaft has been bent.

Shaft alignment may change slightly after your boat is in use. Your dealer should check alignment occasionally, particularly if there is vibration, a drumming sound, or loss of RPMs.

RUDDERS

Your boat has dual rudders. The rudder shaft stuffing box provides an opening for the rudder shaft through the bottom of the boat. The stuffing box keeps water from leaking around the shaft into the boat. The rudder stuffing boxes are similar to those used for propeller shafts.

IMPORTANT: Overtightening the packing retainer to stop stuffing box leakage may score the rudder shaft.

TRIM TABS

Trim tabs are mounted on the port and starboard transom near the bottom of the hull. Trim refers to the running angle of the boat while underway. You can trim your boat by adjusting the single–piston trim tabs to achieve the most efficient planing angle.

A set of switches on the helm command console controls the trim tabs. The switches operate a hydraulic pump along the transom. The pump applies hydraulic pressure to operate the pistons attached to the trim tabs.

You will find information about trimming your boat in Section 10, Pre–Launch and Underway.

TROUBLESHOOTING CHART

PROBLEM	CAUSE	SOLUTION
Excessive vibration	Material obstructing propeller	Remove material from propeller, shaft, or rudder by reversing engines. If necessary, **stop engines** and cut or pull away.
	Bent prop or shaft	Replace propeller. If vibration continues, see your dealer for service.
	Excessive play in shaft log	Check shaft log for wear. Avoid sudden torque changes. See your dealer for repairs.
	Bent rudder	Replace. See your dealer for service.
Poor performance	Material wrapped around propeller	Run engine in reverse. If necessary **stop engines** and cut or pull material away.
	Damaged propeller; wrong propeller in use	Replace propeller.

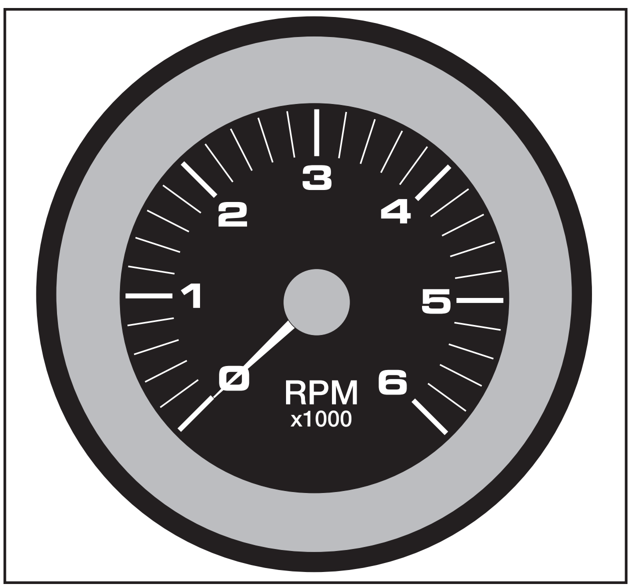
INSTRUMENTATION

A full set of instruments at the helm of your boat shows what is taking place within your engine. Boats with twin engines have duplicate gauges, one for each engine. When you take delivery of your boat, ask your dealer about normal readings of the gauges. This information will provide you with a reference point for the life of the engine. Keep in mind that the readings on some gauges tend to fluctuate which is not uncommon. But when operating your boat, investigate the problem if a gauge reading varies substantially from the normal reading.

Note: Your boat may not have all the instruments discussed in this section. The ranges of your gauges may also vary from the readings listed.

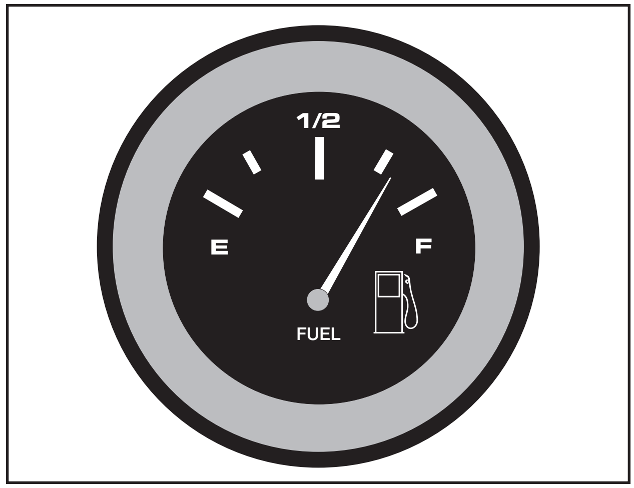
TACHOMETER

The tachometer displays the number of revolutions per minute (RPM) that the engine is running. The gauge is displayed in increments of 200 rpm. The tachometer will show the RPM's under all engine operating conditions. Consult with your dealer if you require additional information. Do not exceed engine manufacturer's recommendations.



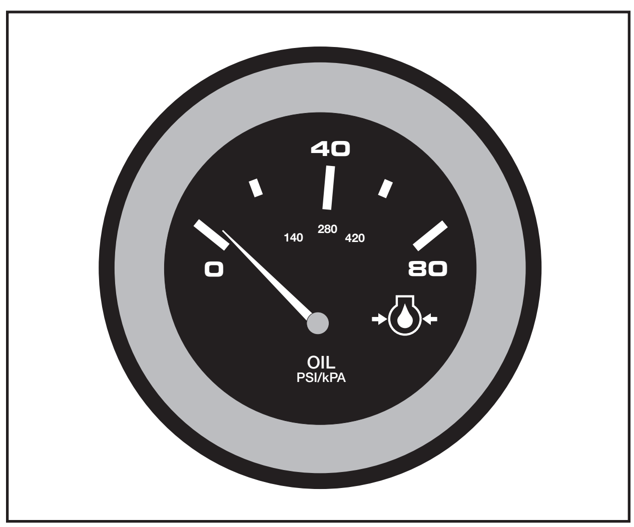
FUEL GAUGE

The fuel gauge displays the approximate amount of fuel in the fuel tank(s). The gauge reading is most accurate when your boat is at a level position. While running, the fuel gauge will usually read higher than the actual level due to the bow of the boat being higher. Since gauge readings are approximate, it is best to compare them to the hours of use versus known fuel consumption in liters per hour (l/h) or gallons per hour (gph). The most common practice of good fuel management is the one-third (1/3) rule. Use one-third (1/3) of your total fuel on board to travel to your destination, one-third (1/3) in returning, and the remaining one-third reserve for emergencies.



OIL PRESSURE GAUGE

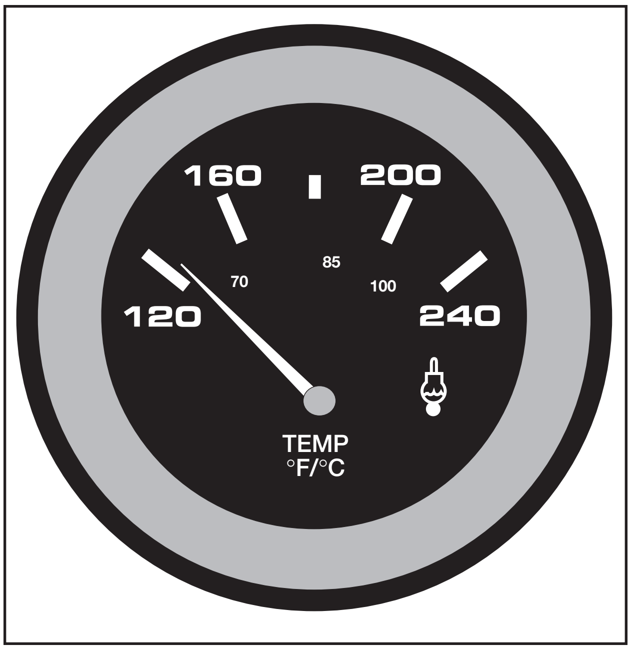
The oil pressure gauge is a good indicator of most, if not all, serious problems that may occur within your engine. A preset valve in the oil pump controls the maximum oil pressure. If a complete loss of oil pressure occurs, stop the engine immediately. If the engine continues to run after loss of oil pressure, serious damage to the engine can result. Check the engine oil level



before every trip and fill if low. If oil level is full and gauge reading is low, contact your dealer or a qualified mechanic to rectify the problem. Do not restart the engine until correcting the problem. See the engine manufacturer's specifications for correct pressure ranges.

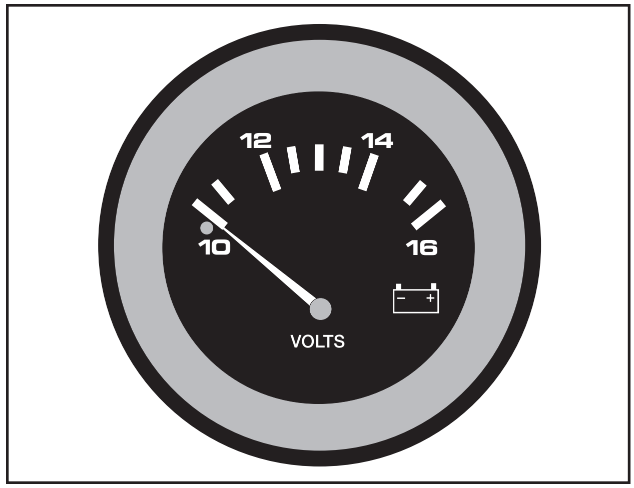
TEMPERATURE GAUGE

The temperature gauge measures the temperature of the engine water cooling system. You should make a practice of always checking this gauge right after starting the engine. Marine engines draw sea water, circulate it through the engine, and expel it overboard through the exhaust system. If the temperature gauge shows that the engine is hot, stop the engine immediately. Refer to your engine owner's manual for instructions and corrective action.



VOLTMETER

The voltmeter measures the condition of the main or cranking battery in volts DC. Normal operating voltage when the engine is running at 1000 RPM or higher is between 12 and 15 volts. If your battery is fully charged, the voltmeter should read in the 11.5 to 12.5 volt range when the ignition is on and the engine is not running. Check your battery and charging system if the voltmeter reads below these normal ratings. An oscillating voltmeter reading may indicate loose belts or loose electrical connections.



SYNCHRONIZER

A synchronizer is an aid in adjusting the throttles so both engines are running at the same speed. Lack of engine synchronization leads to vibration which can be detrimental to the engine, the boat and passengers.

The engines are synchronized when the indicator needle is centered. When the needle points to port, the port engine is running faster than the starboard engine. When the needle points to starboard, the starboard engine is running faster than the port engine.

STEERING

Become familiar with the "feel" of your boat's steering system. Steering does vary from boat to boat depending on hull shape, engine type, water and wind conditions and load. Various steering systems are used on our boats. On smaller boats, a push/pull cable system is used; on larger boats, power assisted and fully hydraulic systems are common.

All steering systems require periodic maintenance to be trouble–free and safe. Regular checks are essential. Be sure to read the manufacturer supplied operator's manual before heading out on the water.

A manually adjustable trim tab is provided on some sterndrives. Follow the instructions provided by the engine manufacturer for proper adjustment. This trim tab, when correctly adjusted, will help reduce steering effort through the entire trim range.

To maintain a straight course, keep at least one hand in control of the steering wheel at all times while underway.

Note: Deep vee boats have a tendency to "hunt" (wander from side to side) at slow speeds with the steering wheel held straight ahead. This is a normal occurrence and can be minimized by anticipating boat movement and giving a slight turn of the steering wheel in the opposite direction.

Note: If the steering system needs repair, your dealer has the correct tools. Do not try to service the system yourself.

STEERING SYSTEM

The steering system on your boat does not have a rudder position indicator. To find the rudders' center position:

1. Turn the wheel to port until it stops.
2. Now turn the wheel to starboard until it stops, counting the number of revolutions as you turn.
3. Divide the number of revolutions by two.
4. Turn the wheel to port that number of revolutions to center the rudders.

MECHANICAL STEERING SYSTEM

If your boat is equipped with a mechanical steering system, periodic lubrication is required to insure a smooth operating system.

The mechanical system consists of a push–pull cable. This cable should be checked for proper lubrication and alignment. There should be no binding or looseness. Cable and attachments should be checked for wear, rust, or corrosion, and be properly lubricated. Check the anchor post at the aft end of the cable to be sure it is secure and free from rust and corrosion.

HYDRAULIC STEERING SYSTEM

Your boat may have a hydraulic steering system. This system has four basic elements: helm pump, reservoir, relief valve, and cylinder. The steering wheel is mounted to the shaft of the helm pump. Turning the steering wheel pumps hydraulic fluid to the steering cylinder. Extra hydraulic fluid and pressure head maintained by the reservoir prevents air from entering the system. An air pressure gauge on the reservoir shows that the reservoir is charged to the proper pressure. To keep dirt from entering the system, hydraulic fluid in the reservoir passes through a filter as it is flows out of the reservoir. A relief valve protects both the mechanical portion of the rudder (in case the rudder strikes a hard object) and the hydraulic system.

This is a manual hydraulic system, not a power steering system. The effort required to turn the wheel will increase as the system is called on to exert more force on the rudder. At no time, should anyone expect this system to turn as easily as a car's power steering.

Check the level of hydraulic fluid in the reservoir regularly and replenish if necessary. The fill cap behind the wheel has a gauge indicating the fluid level. All other maintenance should be performed by your dealer.

STERN DRIVE THROTTLE/ SHIFT CONTROLS

The information in this section deals with the controls on boats equipped with stern drives. The controls vary depending on the number of engines your boat has. Be sure to consult the engine and controls manuals for information specific to the controls on your boat.

SINGLE LEVER ENGINE CONTROL

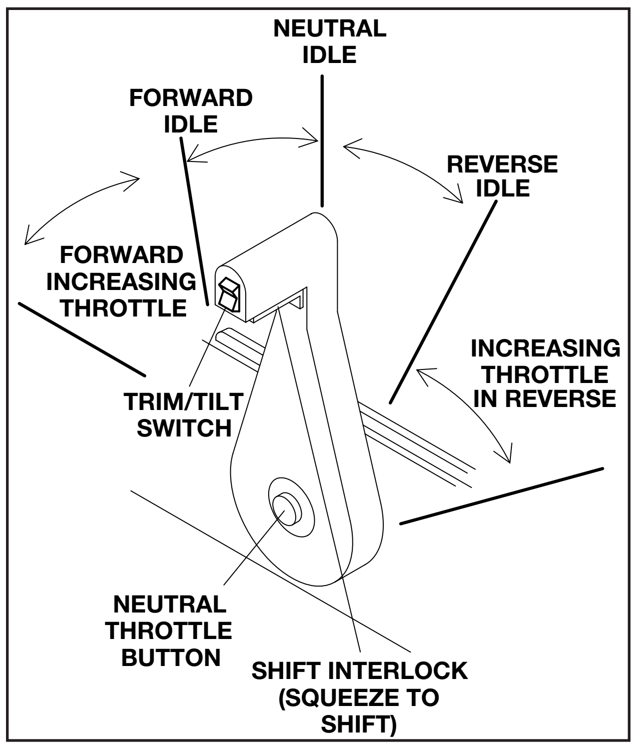


FIGURE 9.1 STERN DRIVE ENGINE CONTROL

A single lever engine control operates as both a gear shifter and a throttle for a single engine (**Figure 9.1**). To shift, move the lever into the first 15° of travel. Advance the lever beyond 15°

to move from shifting range to throttle range. Never attempt to shift gears while the engine is not running.

On boats equipped with a single lever engine control, the control has an engine warmup button near the base. Pressing the warmup button allows the transmission to remain in neutral while the operator advances the throttle for warming up the engine.

TWIN LEVER ENGINE CONTROL

A twin lever engine control operates as both a gear shifter and a throttle for twin engines. The placement of the controls allows the operator to grasp both controls and control both engines with one hand (see **Figure 9.2**). To shift, move the lever into the first 15° of travel. Advance the lever beyond 15° to move from shifting range to throttle range. Never attempt to shift gears while the engine is not running.

The twin lever control has an engine warmup button near the base. Pressing the warmup button allows the transmission to remain in neutral while the operator advances the throttle for warming up the engine.

The trim switch for both the port and starboard engines is on the port engine control lever.

IMPORTANT: Allow the engine to warm up before engaging the shift control. Monitor all instruments while engine is idling during warm-up. See the engine manufacturer's specifications for proper operating ranges.

INBOARD ENGINE AND TRANSMISSION CONTROLS

Controls for inboard engines and transmissions consist of two double levers: two for the engines and two for the transmissions (see **Figures 9.3** and **9.4**). Red and black dots on the handles help the operator distinguish between engine and transmission controls. The dots on the engine throttle controls are imprinted with a **T**.

ENGINE CONTROLS

The two levers on the starboard side of the helm control the engine throttles. The speed of both engines can be changed simultaneously by gripping both throttle levers in one hand, and moving them back and forth together.

Cables and linkage connect each lever to the fuel injection throttle valve on gasoline engines or the fuel distributor on diesel engines. Moving a lever forward increases its engine's speed by increasing the fuel supply to the engine (**Figure 9.4**). Increasing engine speed controls the boat's speed in forward or reverse. Move the throttle slowly and smoothly. Moving the throttle lever rapidly can stall an engine by flooding it with excess fuel.

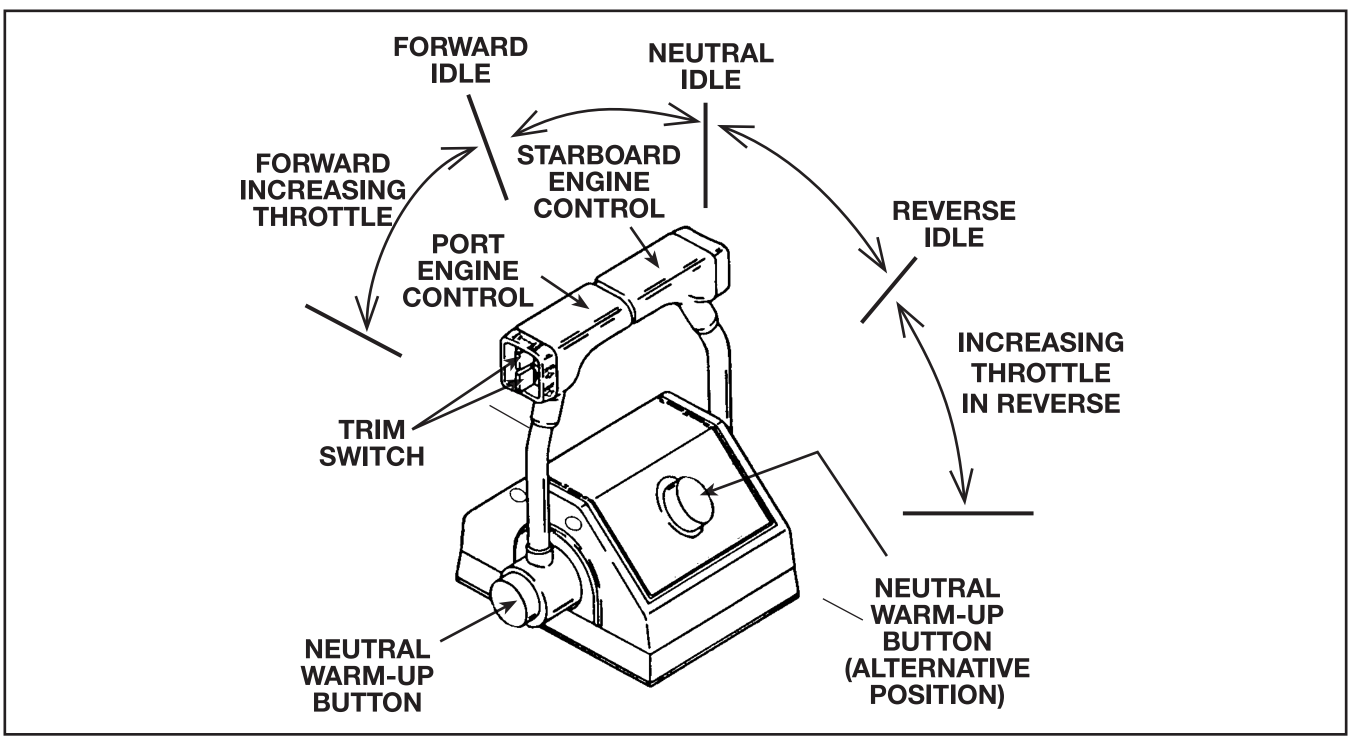


FIGURE 9.2 TWIN STERN DRIVE ENGINE CONSOLES

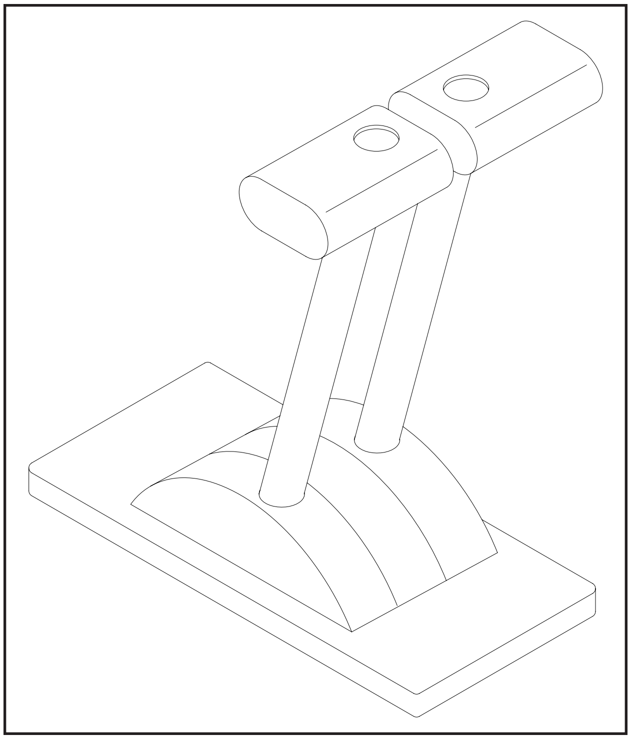


FIGURE 9.3 INBOARD GEAR SHIFTS AND THROTTLE CONTROLS

IMPORTANT: Allow the engine to warm up before engaging the shift control. Monitor all instruments while engine is idling during warmup. See the engine manufacturer's specifications for proper operating ranges.

After your dealer has adjusted the throttle controls, they usually require very little service. They should move smoothly through the full range of lever movement. Be careful when you are in the engine room. Stepping on the cables may cause them to bind. Hard operation of the controls is not normal. At the first sign of difficult or stiff operation, have your dealer check the cable and linkage and make the necessary adjustments or repairs.

TRANSMISSION CONTROLS

The two levers on the port side of the helm control the transmissions and the direction of boat movement. Both shift levers have three positions: forward (up), neutral (center), and reverse (back) as shown on **Figure 9.4**. The neutral position has a detent positioning pin. You can feel the pin drop into the detent when the lever is in neutral. The levers must be in neutral before you can start the engines.

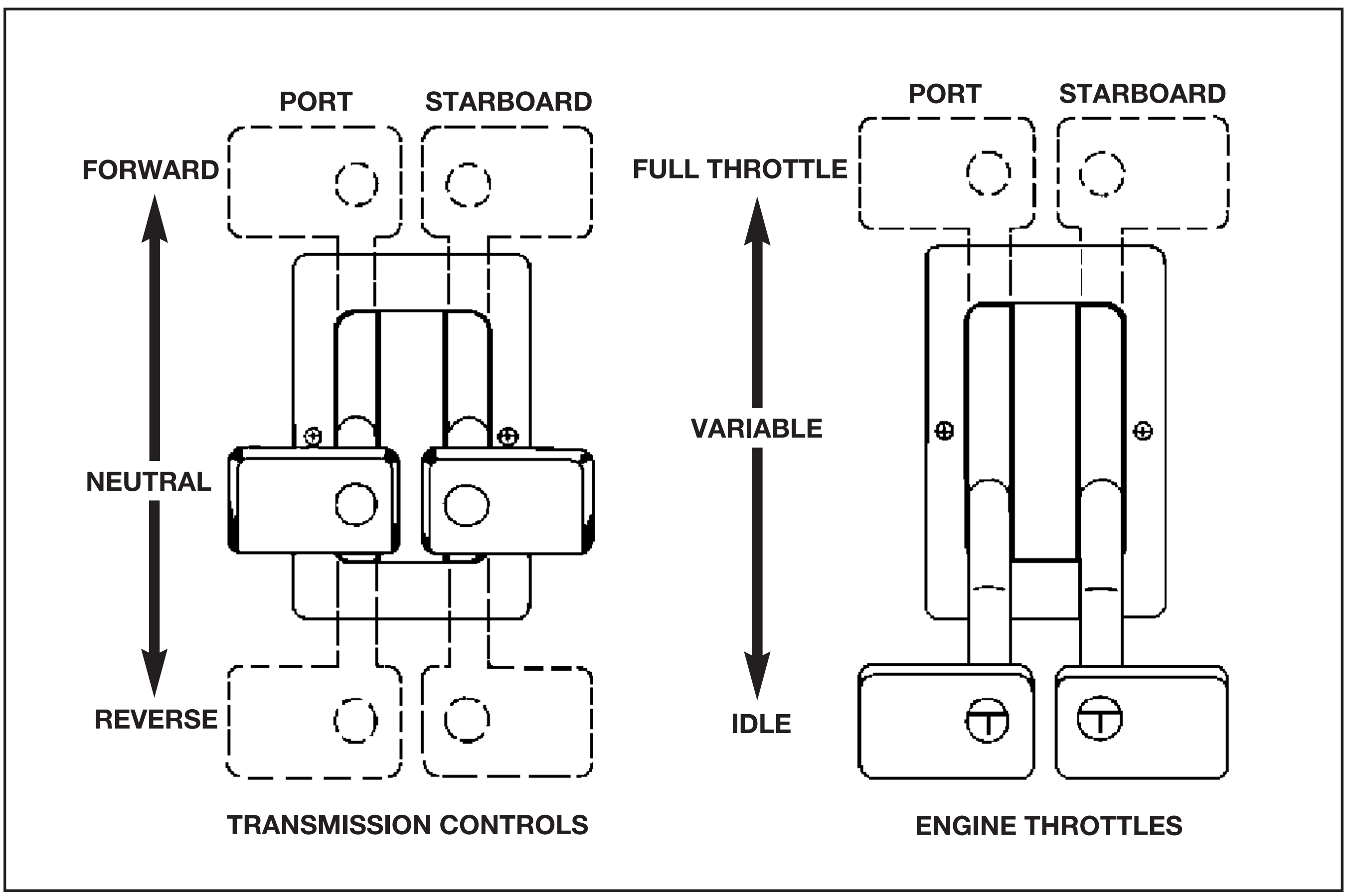


FIGURE 9.4 TYPICAL INBOARD GEAR SHIFT & THROTTLE FUNCTIONS

If an engine does not start even though its transmission lever is in neutral, the neutral safety switch may be slightly out of adjustment. While you are turning the ignition key, slowly move the transmission lever up or down a short distance over the detent until the engine starts. Have your dealer adjust the switch as soon as practical.

When maneuvering at speeds under 1,000 rpm, you can reverse (move control lever forward or aft) the transmission. This causes a braking action to help stop the boat. When shifting from forward to reverse or vice-versa, hesitate in neutral long enough for the propeller to slow its turning. Quickly shifting from forward to reverse and back again is hard on the engine and the transmission. *Never shift from forward to reverse or vice versa when your tachometer reads over 1,000 rpm.*

MARINE COMPASS

You will find that the marine compass is a useful, but sensitive, instrument. In order for the compass to be accurate, it must be adjusted to compensate for the effects of iron or magnets and wires carrying electricity in the vicinity of the compass. Have your dealer make the initial and subsequent periodic adjustments.

DEPTH SOUNDER

Your electronic depth-finding instrument measures the time a sound wave takes to travel from the vessel to the bottom and return, and displays the result in feet, fathoms or meters.

SYSTEMS MONITOR

This gauge indicates engine operating conditions and warns you when to check your engine. When the CHECK ENGINE indicator lights, you should have your engine checked by your dealer. When the LOW OIL indicator lights, the oil level in the oil reservoir is low . If the NO OIL or WATER TEMP indicator lights, stop your engine immediately and correct the problem.

Depending on the type of engines, you boat is also equipped with audible alarms which will sound when you start the engine(s). These audible alarms also indicate the visual alarms indicated on the system monitor. Refer to your engine manual for complete details about the operation of engine alarms.

LAUNCH AND CRUISE CHECKLIST

- ☐ Get a current weather report. If the weather will not be favorable, postpone your trip.
- ☐ Install hull drain plugs.
- ☐ Inspect the hull and propeller for damage. Excessive dirt or marine growth will affect your boat's performance and fuel efficiency.
- ☐ Check the electrical system and navigation lights.
- ☐ If your boat has been in the water, run the bilge pump until the flow of water stops.
- ☐ If your boat has been out of the water, check to see that all bilge water has drained out. Then install the drain plug.
- ☐ Check that all required safety equipment is on board and in good working condition. Examples include personal flotation devices (PFDs), horn, fire extinguisher, visual distress signals, etc. Take along a gallon of drinking water.
- ☐ Check that all other required equipment is on board. Examples include mooring lines, anchor and line, tool kit, first aid kit, etc.
- ☐ Open engine compartment. Inspect for fuel odors and visible leaks in the fuel, oil, coolant, exhaust and power steering systems.
- ☐ Visually inspect engine for cracked hose, defective belts, or other signs of engine problems. Check engine oil and battery water levels. Check power steering fluid level. Check battery electrolyte range.
- ☐ Check fuel level. Fuel tanks should be filled to slightly less than capacity. Allow for fuel expansion.
- ☐ Check that all engine drains are closed (stern drives).
- ☐ Make sure navigation charts and equipment are on board.
- ☐ Check operation of bilge blower, steering system, navigation lights, and operation of horn.
- ☐ Make sure passengers and crew know what to do in case of an emergency and how to operate safety equipment.
- ☐ Make sure all required documents are on board.
- ☐ File a float plan with a responsible party ashore.

FUELING

⚠ WARNING

Do not smoke, extinguish all open flames, STOP all engines and other devices that could cause sparks, including the bilge blower. Do not use electrical switches or accessories. Shut OFF all stoves that may produce a spark or flame. Close all openings into the cabin area of the boat.

RECOMMENDATIONS

⚠ CAUTION

Follow engine manufacturer's recommendations for types of fuel and oil. Use of improper products can damage the engine and void the warranty.

Although alcohol boosts the octane level of gasoline, it also attacks the rubber fuel distribution lines and even metal fuel system components. Alcohol will permeate most fuel hoses and other components such as fuel pump, gaskets and seals, and can also contribute to fuel system contamination.

The hoses we use in our boats are alcohol-resistant as are the materials used by the engine manufacturers. If only fuel containing alcohol is available, or the presence of alcohol is unknown, you must perform more frequent inspections for leaks and abnormalities. Any sign of leakage or deterioration requires your immediate attention. Refer to the engine manufacturer's recommendations on fuel type and octane ratings.

PRELIMINARY GUIDELINES

1. Safely secure your boat to the dock.
2. Close all hatches, windows, doors and compartments to prevent accumulation of fuel vapors.
3. Ensure that a fire extinguisher is readily available.
4. Do not store fuel in areas that are not adequately ventilated.
5. Use only fuel lubricants recommended by the engine manufacturer.

PUMPING FUEL

⚠ WARNING

When fueling or having your boat fueled by an attendant, be sure the waste pump-out or fresh water fitting is not mistaken for the gas fill.

1. Be sure to fuel in a well-lit area gasoline spills are unnoticeable under poor lighting or in the dark.
2. Remove the gas fill cover.
3. Insert the fuel supply nozzle, keeping it in contact with the fuel fill plate to guard against static produced sparks.
4. Stand away from the fuel tank vent and gas fill during fueling. Splashback may occur and can be an eye irritant and/or a fire hazard.
5. Avoid spillage. Fuel spilled or pumped into the water is harmful to fish and wildlife. Discharging fuel into the water contaminates the environment and violates the law. Wipe up any excess fuel immediately.

⚠ DANGER

Fumes from rags used to wipe up fuel spills can explode if stored on the boat. Dispose of rags properly ashore before getting underway.

6. After pumping approximately 10 gallons of fuel into the fuel tank, inspect the engine and fuel tank area for any signs of leakage. If no leaks or other problems are detected, resume fueling.
7. Allow space at the top of the tank for thermal expansion.
8. If fuel cannot be pumped in at a reasonable rate, check for fuel vent blockage or a kink in the line.

AFTER FUELING

1. Replace the gas fill cover and wipe up any fuel spilled.

2. Open the engine compartment and all hatches, windows, doors and other compartments that were closed during fueling. Inspect these areas for the odor of fuel vapors and visible fuel leakage.

3. If there is no fuel leakage, run the bilge blower for at least five (5) minutes before starting the engine, and until the boat has reached its cruising speed. If you detect spilled fuel, do not run the blower as it will not evacuate all gas fumes. Contact fuel dock personnel for assistance.

> ⚠ **WARNING**
>
> **Investigate and correct any sign of fuel leakage or indication of vapors before starting engine. Do not run blower or operate any electrical switch until problem is corrected. Fire or explosion may result.**

LOADING PASSENGERS AND GEAR

NOTE: All boats under 26 feet in length must have a capacity rating plate showing the recommended person capacity as well as the maximum capacity of the boat including persons, engine and gear. Boats over 26 feet do not have a capacity plate. The captain is responsible for using common sense and good judgment regarding boat loading and the number of passengers allowed aboard.

When loading, always step into the boat, never board by jumping. Have someone on the dock pass your gear aboard. Secure all gear firmly so it doesn't move or interfere with operation of the boat. Passengers should board the boat one-at-a-time and be seated. Passengers should remain seated during loading of the boat to maintain an even trim **(Figure 10.1)**.

> ⚠ **WARNING**
>
> **Passengers seated in the bow area should not obstruct the driver's vision.**

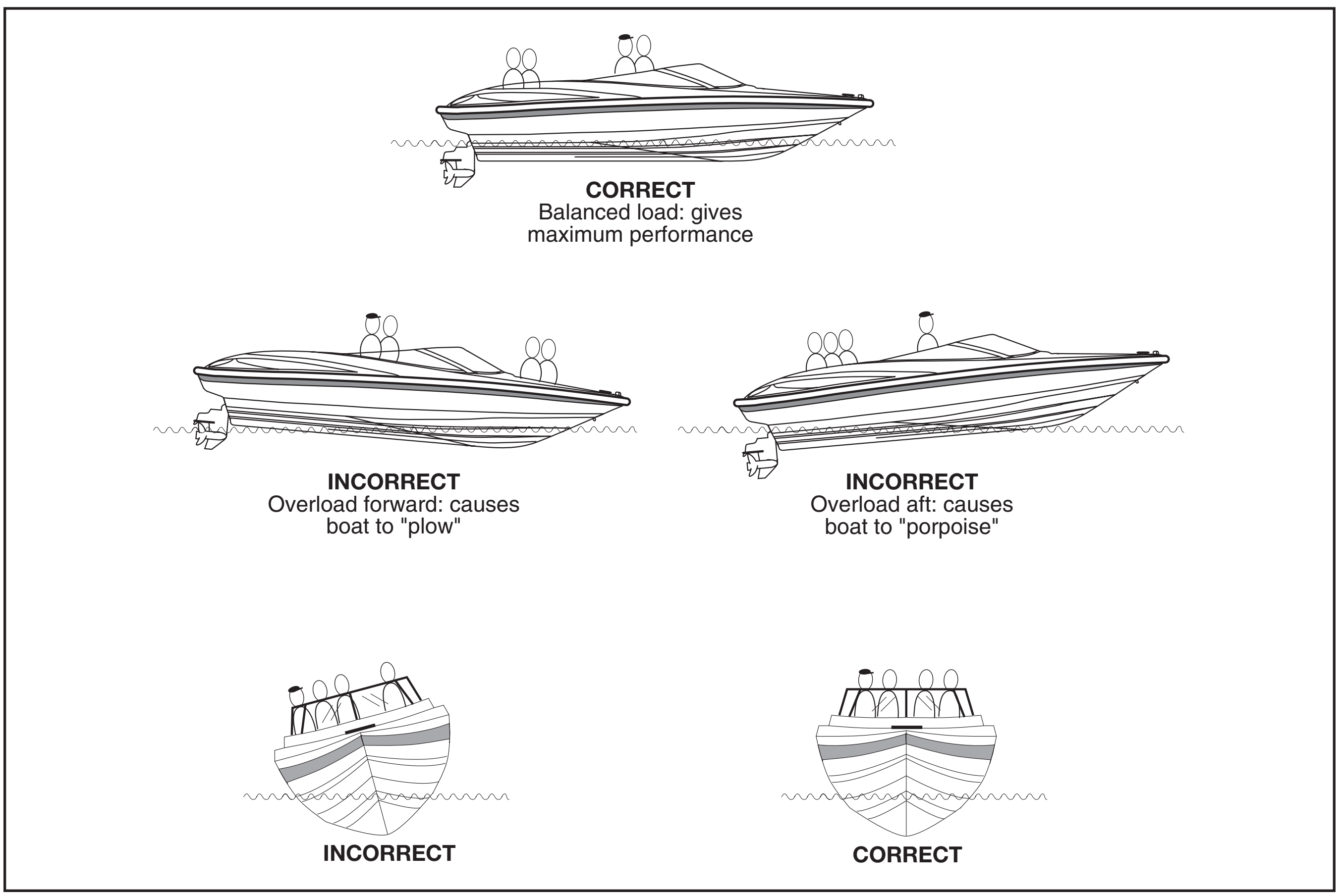


FIGURE 10.1 LOADING PASSENGERS AND GEAR

IMPORTANT: Passengers are prohibited from riding on the bow with feet hanging over the side or ride while sitting on the stern, gunwales or setbacks. The Coast Guard considers these acts to be negligent or grossly negligent operation. They are prohibited by law because falls from moving boats are a major cause of fatal recreational boating accidents.

IMPORTANT: The presence of the capacity plate does not relieve the boat operator from the responsibility of using common sense or sound judgment. Turbulent waters and adverse weather conditions will reduce the maximum load capacity rating of the boat.

STARTING PROCEDURES

The operation and maintenance manual supplied with your engine provides pre-start, starting and cold-starting instructions. The following information is merely a guide and not intended to explain in detail all starting procedures and instructions. Refer to your engine owner's manual.

PRELIMINARY CHECKS

1. Secure boat to the dock before attempting to start engine. The boat should be kept secure until the engine is running and warmed up.
2. Operate the bilge pump until the flow of water stops.
3. Make sure the throttle is in the neutral position and stern drive or outboard is lowered into water.
4. Make sure passengers seated in the bow area do not obstruct the driver's vision.

STARTING

⚠ DANGER

To prevent excessive exposure and reduce the possibility of carbon monoxide accumulation in the cabin and cockpit areas of the boat, the operator should provide adequate ventilation in each of these areas. Utilize all hatches, doors, windows and side vents to increase air movement. See Section 2 for information about the dangers of Carbon Monoxide.

1. Check all electrical systems and navigation lights.
2. If your boat is equipped with an optional battery selector switch, turn the battery switch to 1, 2 or ALL position.
3. If your boat has fuel injection, turn the key to start the engine. Engine will not turn over if throttle is not in the neutral position.

   If your boat does not have fuel injection, depress the engine warmup button to advance the throttle several times and leave it in the SLOW/START position. This will actuate the carburetor accelerator pump and feed fuel to the engine. Turn ignition key to START position.
4. When engine is cold, run engine approximately one (1) to two (2) minutes at fast idle speed (1200 to 1500 RPM). This step is not necessary with fuel injected engines.
5. Once engine has warmed up, check water temperature gauge to ensure engine temperature stays within optimum range. If temperature reading is abnormally high, stop engine immediately and inspect for cause of high reading.
6. With engine running, voltmeter should show a reading between 12 and 15 volts.
7. Check steering operation. Turn steering wheel full to port and starboard while observing outdrive movement.
8. Inspect for fuel odors and visible leaks in the fuel, oil, coolant, exhaust and power steering systems.
9. Make sure boat is securely moored to the dock and engine is idling. Then move the throttle forward and then aft and back to neutral to check for proper operation of the shifting motion. Be careful. Leave the engine in gear for only a second or two.

MANEUVERING

> ⚠ **WARNING**
>
> **Boat steering is not self-centering. Steering is affected by engine and propeller torque, trim tab setting, wave and current action and the speed of the hull through the water. Constant attention to steering is required for safe operation.**

When all your pre-departure checks have been completed and the engine has warmed up, you will be ready to leave the dock. Take into account the amount of wind, tide current, and other forces that may affect your maneuvering as you leave the dock. Idle speeds work best when maneuvering to and from the dock. Do not forget to release the mooring lines.

LEAVING THE DOCK

You are ready to leave the dock after the engine has warmed up. Check all gauges for appropriate readings before casting off. If oil pressure is abnormally low or engine temperature is abnormally high, stop the engine immediately. Check voltmeter to be sure the charging system is working properly. Check for fuel, oil, and exhaust leaks. Correct the cause of any abnormal condition before getting underway.

> ⚠ **WARNING**
>
> **Make sure passengers sitting in the bow area do not obstruct the operator's vision when casting off or while underway.**

After making sure your boat is ready, check wind, tide, current and other forces that will affect the way you maneuver your boat away from the dock. Throw mooring lines off to your boat. Shift your boat's engine into forward or reverse depending on whether you want to move the bow or the stern away from the dock first. Run your engine at a slow speed as you move away from the dock. If you move the bow out first, watch that the stern of the boat does not swing into the dock or a piling.

Once away from the dock, devote some time to learning how to maneuver. Practice docking using an imaginary dock. Practice stopping and reversing.

STOPPING

You do not have brakes on a boat. Practice stopping maneuvers and learn early how your boat reacts. From forward motion, pull the throttle back towards NEUTRAL. Depending on your speed, the distance the boat travels until it comes to a complete stop will vary. The ability to measure the distance will only be acquired through experience.

Once the boat has slowed and motor is idling, place the shift in REVERSE. Gradually increasing reverse power with the throttle will allow you to stop the boat in a very short distance.

NOTE: A boat will not respond to steering in reverse nearly as well as it does when going forward, so do not expect to accomplish tight turning maneuvers when backing up.

Remember that all boats steer by the stern (the feeling is much like steering your automobile in reverse). This means that the stern of your boat will swing in the direction opposite to your turn. For example, when you turn the helm wheel to the left, the stern of your boat will swing in the direction opposite to your turn. This is especially important to keep in mind when docking, operating in close quarters with other boats, or when approaching a swimmer or downed skier in the water.

Once you have spent enough time practicing maneuvers and have a feel for how the boat handles, you will be ready to run in open waters.

ACCELERATION

> ⚠ **WARNING**
>
> **Before accelerating be sure your path is clear; the bow will rise and momentarily obstruct forward vision. Make your passengers aware of your intention to accelerate.**

Before bringing your boat "on plane", check the entire area to make sure you have a clear, safe path. As you throttle up to accelerate, your boat will increase its angle of trim, causing the bow to ride high. From a maximum angle, the boat will level out to its planing attitude with continued acceleration. This maximum angle is known as the "hump". Because visibility, handling, and performance are reduced, it is advisable to get "over the hump" as soon as possible. A few seconds at full throttle should get the boat over the hump and into its planing attitude.

After getting over the hump, accelerate until reaching a comfortable plane, then throttle down to cruising speed. This also will provide for better fuel efficiency.

TRIMMING YOUR BOAT

Trim tabs are used to add lift to the boat's stern, thereby changing the boat's attitude **(see Figure 10.2)**. This lift can help the boat get on plane faster and remain on plane at slower speeds than if no tabs were used. Used independently, tabs can also correct listing conditions caused by crosswinds, unbalanced loading and quartering seas. Trimming your boat properly involves two separate procedures, trimming or tilting the lower unit and setting the trim tabs.

When you are sitting dead in the water, your outboard should be down and the trim tab switches are in the BOW UP position. Accelerate until you get onto plane. At this point your boat will be plowing through the water with the bow down too far. Trim the lower unit up slightly until the bow comes up. If you trim the lower unit out too far, your boat will porpoise or the propeller will cavitate, and the bow will slam up and down on the water. Your boat is trimmed correctly when it is just short of porpoising or propeller cavitation, under ideal running conditions.

Trim your boat to compensate for seas, winds, or uneven loads.

Head Seas	Trim drives in more than usual. Use tabs to keep bow down and go at a slower speed.
Following Seas	To prevent taking seawater over the bow, trim drives out and keep tabs up to keep bow up.
Listing Due to Quartering Seas, Beam Wind, or Uneven Load	Use tabs independently to adjust for list. If listing to starboard, press port bow down switch. If listing to port., Press starboard bow down switch.

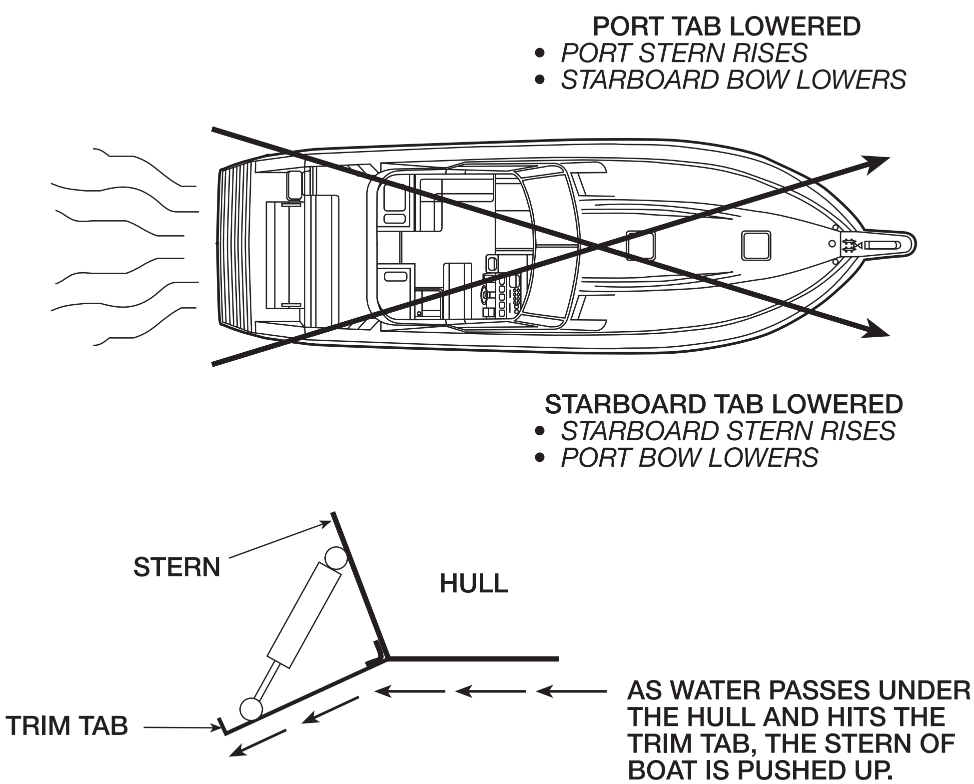


FIGURE 10.2 TRIMMING THE BOAT WITH TRIM TABS

Remember that most boats react very slowly to trim tabs. Often boat owners do not give trim tabs time to work. Press the trim tab switches for only two seconds at a time and then allow some time for the boat to react. If the boat is still listing after a minute or two, press the trim tab switch again for a two second interval. The labels on the trim tab switches indicate what you want your boat to do, not what you want the tabs to do.

It is a good idea to take your boat out onto open water shortly after you get it and experiment with the trim tabs. After you get your boat onto plane, set the tabs in various positions and note how your boat reacts. This will give you a feel for the trim tabs work.

It is possible to extend the cylinder life expectancy on your trim tabs. To do this, keep the cylinders retracted while at dockside. Press both trim tab controls down until tabs reach their full up position.

TILT/TRIM CONTROL SWITCHES

NOTE: Trim refers to the angle of the lower unit or outboard motor in relation to the bottom of the boat. With respect to trimming, the words *in*, *down*, *under*, and *forward*, have the same meaning as do *up*, *out*, and *aft*.

1. The standard trim control switch is located on the control lever handle.

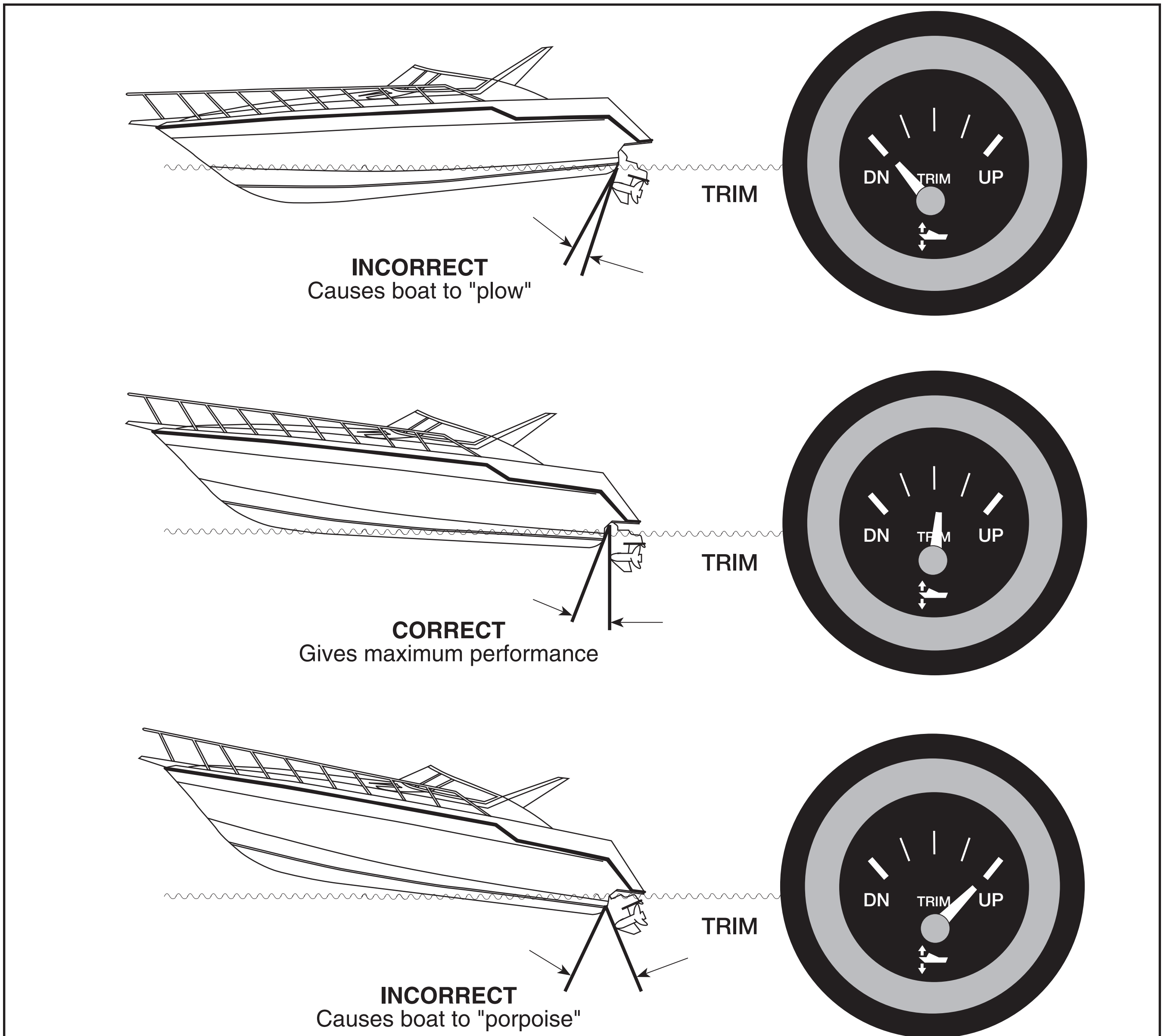


FIGURE 10.3 TRIMMING THE BOAT OUTDRIVE

2. The switch controls the position of the stern drive or outboard motor. Proper trim is very important in boating.

3. In the case of low or heavy bow attitude, the boat tends to "plow" **(Figure 10.3)**. The lower unit is trimmed too far under or forward. Trim the unit UP (out) to correct this situation.

4. If the bow is too high, the boat tends to "porpoise" **(Figure 10.3)**. The drive unit is trimmed up or out too far. Trim DN (in) to correct.

5. A good practice is to get underway (especially when fully loaded or pulling a skier) with the unit trimmed all the way DN (under). After the boat is on plane, adjust the trim out slightly to obtain the proper bow attitude and engine speed.

6. Trim also affects propeller selection and fuel efficiency. All models should be "propped" to be in the upper half of the maximum RPM range with the boat lightly loaded and the drive trimmed up to maximum. This configuration allows the engine to operate within the recommended RPM range with a heavy load.

   The power unit should never be trimmed up to a point where the propeller cavitates (or slips). A rapid increase in engine RPM's is evidence of cavitation. If this occurs accidentally while running at full throttle, immediately lower the drive trim and reduce the throttle until the slipping stops. If necessary, have your dealer reset the trim limit switch (if provided) to avoid overtrimming in the future.

   If the prop slips at lower planing speeds, the drive may be trimmed too high. Immediately lower the drive unit until the prop grabs again to restore efficiency.

7. Trimming out, in addition to raising the bow, also lifts the boat higher, gaining speed because less hull is in the water.

8. Raise tabs all the way up when coming off plane. Retrim boat when accelerating again. Readjust tabs if necessary to compensate for new direction of wind or seas.

9. The trailering position of some stern drives is controlled by a separate switch on the dash switch panel or throttle/shift control. ***Do not activate this switch while engine is running. Doing so can severely damage the lower unit and engine.***

NOTE: Refer to the control instructions regarding the power trim controls installed on your boat.

EXCESSIVE NOISE

Remember to be a good boating neighbor. Sounds can carry a long distance over water, especially at night. Loud conversations and music can be disturbing to others as can excessive engine noise. Check with local authorities regarding any noise restrictions.

ANCHORING

1. The weight of the anchor and diameter of anchor line should be governed by the size and weight of your boat. Get advice from your dealer before you buy an anchor.

2. Keep anchor secure while underway to prevent damage or injury due to sudden shifting in the boat's attitude.

3. Use two or more anchors if anchoring overnight or for extended periods. If not using two anchors, make certain there is sufficient clearance for your boat to swing in a full circle to prevent damage in case of shifting winds.

4. Make certain you have enough anchor line (or scope) for the depth of water. Your anchor line should be 6 to 7 times the depth of water anchored in. For example, if you are in 20 feet of water, use 120 to 140 feet of anchor line.

⚠ CAUTION

Secure anchor line only to bow eye or deck cleat. Never tie anchor line to a rail, rail fitting or other hardware not designed to support this stress.

DROPPING ANCHOR

1. Have a crew member carefully lower the anchor. Keep slight tension on the anchor line while lowering and maintain your tension after reaching the bottom.

2. Maneuver the boat slowly backwards until length of anchor line is 6 or 7 times the depth of the water.

3. Fasten the anchor line around the bow eye or deck cleat. Anchor flukes should dig in and catch. Watch for anchor drag by checking shoreline landmarks at the time the anchor is dropped and one-half hour later. If the boat has drifted away from these reference marks, the anchor is dragging and must be reset.

WEIGHING

1. Start the engine running before pulling in anchor.

2. Slowly maneuver the boat forward to reduce tension on the line and make retrieval of the anchor line easier.

3. Pull in anchor line until the line is vertical. Pull firmly to lift the anchor's shank and free the flukes from the bottom.

If the anchor becomes stuck, attach the vertical line to the mooring cleat. Wave action on the bow may lift flukes from the bottom and free the anchor. If the anchor is still stuck, feed out a few feet of line and attach it to the bow cleat. Maneuver the boat around the anchor, keeping the line firm. Determine the angle that will work to pull the anchor free.

Anchors are available in different shapes, sizes and weights to fit different boats, uses, and conditions. Your dealer can tell you which anchor will work best for your boat.

NAVIGATION LIGHTS

Although night activities are limited, cruising at night can be very pleasurable. It can also be dangerous if you don't pay close attention to water levels and obstacles. Be especially careful of shallow waters and watch for submerged debris, rocks and other obstacles in the water. Your navigation lights are intended only to prevent collision, not to improve your night vision. You may choose to use a spotlight instead.

NOTE: It is illegal to use your spotlight as a headlight. Use it only temporarily to check the position of your boat and the surrounding area.

Your boat has one white (stern), one red (port) and one green (starboard) light. The stern light may be a removable pole light. To use the light, line up the two-prong plug in the pole with the receptacle in the base. Plug the light in, and lock it into place with lever/slide lock. When not in use, stow the light inside your boat for safekeeping. This light can be turned on or off at the helm.

Check lights for proper operation before heading out at night. You should also learn to identify the running light combinations for other vessels. We recommend that you participate in a boating safety course to further learn about navigation lights and safe boating practices.

The anchor lights and navigation lights are controlled by a switch at the helm. The anchor light switch allows you to turn on just the stern (white) light when anchored or moored. While underway, use the navigation light switch to turn on the stern (white), port (red) and starboard (green) lights. Lights are off when switches are in the OFF position.

HAZARDOUS CONDITIONS

STORMS

Storms sometimes appear without advance notice. Although weather information from meteorological observation and reporting stations is available, weather bureaus are known to have failures in their predictions or information gathering equipment. There is no substitute for a strong understanding of what action to take when the weather takes a turn for the worst. Many marinas fly weather signals. You should learn to recognize these signals and monitor your local weather forecasts before leaving port.

The present and forecasted weather conditions are of primary consideration, but a threat of possible storms should always be a concern. Observance of the following information will help in your safety afloat if storms do occur:

- Keep a watch on the horizon for approaching storm indicators.

- Turn radio ON. Dial in local weather station and monitor forecast. If your boat has a VHF radio, check the weather channels.

- The best possible situation is to return to a safe port if time allows.

- Close and secure all portals and hatches. Stow all loose gear below deck and tie down any gear required to remain on deck.

- Reduce speed as the seas build. Make sure all passengers are wearing their PFDs.

- If you lose power, keep the boat headed into the waves by rigging a sea anchor off the bow **(Figure 10.4)**. If there is no sea anchor on board, use a canvas bucket or any object that will offer resistance.

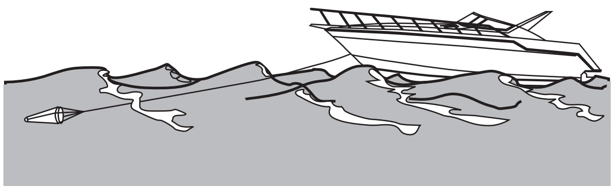


FIGURE 10.4 SEA ANCHOR

- Radar reflectors (if installed on your boat) should be 18 inches diagonally and placed 12 feet above the waterline.

FOG

Fog is a result of either warm surface or cold surface conditions. You can judge the likelihood of fog formation by periodically measuring the air temperature and dew point temperature. If the spread (difference) between these two temperatures is small, you likely will incur a fog situation. Remember the following guidelines:

- Turn on running lights.

- As fog sets in, take bearings and mark your position on the chart while continuing to log your course and speed.

- Make sure all persons aboard are wearing their PFDs.

- If your boat has depth finding equipment, take sounding and match them with soundings on your charts.

- Station a person forward on the boat as a lookout.

- Reduce your speed. From time to time, stop engine and listen for fog signals.

- Sound the proper horn or fog bell at proper intervals to warn other boaters.

- If there is any doubt in continuing boat movement, anchor. Listen for other fog signals while continuing to sound the proper fog horn or bell for a boat at anchor.

RUNNING AGROUND

> ⚠ **WARNING**
>
> **To prevent boat damage, DO NOT use deck hardware for towing. Use a commercial towing service.**

Operating in shallow water can present a number of hazards. Sand bars in narrow inlets are constantly shifting, making it difficult to mark them with buoys. Sometimes sand bars are indicated by waves as they form into breakers when passing over sand bars. In coastal areas, tides can change water levels by as much as 30 feet. Check with local marinas or Coast Guard stations for tide tables and current charts.

If your boat runs aground, first check persons aboard for injury. Then check for damage to the boat. If the drive unit strikes an underwater hazard, check for boat and drive unit damage. If the engine vibrates excessively after striking an underwater obstruction, it may indicate a damaged propeller. If vibration is noticeable, return to port slowly to prevent further drive and engine damage from an out-of-balance condition. Watch the temperature gauge to make sure you do not overheat the engine.

If the boat is not taking on any water, it may be possible to rock the boat by shifting the weight of the passengers and gear and by raising the drive unit while reversing the engine.

If you ground your boat on a sand bar, shut down the engine and seek help from another boater or radio for help. See your dealer as soon as possible, as sand ingested in the engine cooling system can cause major engine damage.

WARNING MARKERS

It is a good idea to find out about hazardous areas and how they are marked by asking your local authorities.

- Boaters must also recognize the flag designs which indicate that scuba divers are present and keep well clear of the area.

- Watch for swimmers. Swimming areas may not be marked. Steer clear from the area and always remain alert.

- Distress flags indicate a fellow boater is in need of assistance.

- Navigation markers serve as a means of identifying navigable routes and indicate water hazards. Boaters should become familiar with navigation markers and stay within marked boundaries and clear of hazards.

REACTING TO EMERGENCIES

Be prepared to deal with emergencies before they happen. Try to formulate a plan for each type of emergency in advance so that decisions can be made quickly and without hesitation. Precious moments lost can mean the difference between losing and saving a life.

FLOODING

If your boat starts taking on water, activate the bilge pump immediately. Make sure all passengers are wearing their PFDs. Open the engine compartment, look for the cause of the flooding. Check all hoses, through hull fittings, sea cocks and strainers. If flooding occurs as a result of collision or grounding damage, call for assistance and head for shore if possible.

CAPSIZING AND MAN OVERBOARD

By far, the largest number of boating fatalities involve capsizing and falling overboard accidents. By being prepared ahead of time with an appropriate plan of action, you can greatly lower your chances and your passengers' chances of becoming seriously injured.

CAPSIZING

Wear PFD's or have them readily available at all times. If your boat capsizes, and others were on board, locate them and guide them to the safety of the hull. Even if the boat floats in an upside-down position, stay with it. The boat hull is much easier for rescuers to spot than a human head sticking out of the water. DO NOT attempt to swim ashore, it may be further than it looks.

MAN OVERBOARD

Think through and follow these procedures if someone in your boat falls overboard.

- Remember, every second counts, you must act fast.

- Move throttles to idle position immediately and yell "MAN OVERBOARD."

- Throw some floating object overboard immediately. Keep your required Type IV PFD accessible at all times for such an emergency.

- Keep the person in the water in sight at all times. Have a passenger do nothing but watch the person. Do not go into the water to help the victim. One person in the water is enough trouble.

- Circle around quickly, approaching into the wind and waves. When the person is alongside, put the engine in neutral and throw them a Type IV PFD with a line attached or extend a paddle or boat hook within his/her reach.

COLLISION

If a serious collision occurs, you should first check the condition of all passengers aboard, then inspect your boat to determine the extent of damage.

1. Make sure all persons aboard are wearing their PFDs.

2. If you need help and your boat has a ship-to-shore radio, first contact the U.S. Coast Guard (VHF Channel 16) or other rescue authorities immediately.

3. Prepare to assist the other vessel unless your passengers and/or boat are in danger.

4. If the bow of the other boat penetrated your boat's hull, prepare to block the opening once the boats are separated.

5. Shore up the hole with a spare PFD or bunk cushion from your boat.

6. While blocking the hole, trim the boat so that the hole is out of the water.

FIRE

Most fires are caused by electrical problems or careless fueling practices. A fire on board your boat is a serious emergency. You must work quickly to implement safety procedures. If a fire occurs, immediately stop the engine.

1. Make sure all persons aboard are wearing their PFDs.

2. If the fire is small, attempt to put it out with your fire extinguisher. If the fire is in the engine compartment, turn off the bilge blower. Do not open the engine compartment. This feeds oxygen to the fire and may cause it to flare up.

3. If the fire gets out of control, execute a distress signal and call for help if equipped with a ship-to-shore radio.

4. All persons aboard should jump overboard and swim a safe distance away from the flames.

IMPORTANT: All persons aboard should know the location and proper operation of the fire extinguishers.

Guidelines

- Use only approved marine cooking and heating systems.
- Open flames demand constant attention.
- Keep flammable materials in approved containers in a overboard vented locker sealed from the interior of the boat.
- Ensure ventilation systems are unobstructed.
- Remove mooring covers before starting engine.
- Check the bilge for fuel leaks.
- Extinguish smoking materials carefully.
- Use special care with flame or high temperatures around urethane foam.
- Check cleaning products for flammability.
- Ventilate when cleaning or painting.
- Disconnect electrical system from its power source before performing maintenance.
- Replace breaker or fuse with same amperage device.
- Electrical appliances must be within rated amperage of boat circuits. Observe the boat carefully while the electrical system is being energized.
- Allow only a qualified marine electrician to service the boats electrical system.

MEDICAL EMERGENCY

Accidents while boating can and may happen. Be prepared to handle these emergencies when they happen. Keeping a first aid kit and dry blankets on board can assist during these situations. It is also a good idea to contact your local Red Cross for information and training on first aid and CPR.

PROPULSION FAILURE

Before you call for help regarding an engine or drive unit failure, it is a good idea to eliminate the possibility of simple problems. Turn off the engine and check to see that (1) there is fuel in the tank; (2) the engine cooling intakes on the outdrive are not clogged; (3) props are clean and free of weeds, netting, etc.; (4) no hoses are leaking; (5) there is oil in the engine.

Once you have checked out the possibilities listed above and find they are not the problem, call for help giving your position and a detailed description of your boat.

CONTROL FAILURE

In the unlikely event of a throttle/shift failure, shut down the engine immediately. Carefully check the control connections in the engine compartment to see if they are secure. If not, try to locate the attaching hardware and reassemble. If that is not possible, try to use whatever is available such as paper clips, hair clips, tape, etc., to secure the connections. If a temporary repair is made, return to port at the slowest steerable speed and be prepared to take emergency action should the temporary repair fail also. Have your dealer make repairs before using the boat again.

STEERING FAILURE

If a problem with the steering occurs, shut down the engine immediately. Check the connections to the outboard motor or drive unit in the engine compartment. Some boats have a push/pull cable while others will have hydraulic hose connections. With cable connections, check the attaching hardware and tighten it if necessary. If you have hydraulic hose connections, check to see if they are leaking. If so, tighten the connections and check the hydraulic fluid reservoir level. Most stern drives are power assisted and

have their own hydraulic reservoir and engine mounted drive pump; check the level of reservoir and drive pump belt. If the steering is not operating properly, do not operate the boat and call for assistance.

ADDITIONAL UNDERWAY INFORMATION

- Always be aware of local laws on noise limits. Noise means engine noise, radio noise or even yelling by people on your boat. Good seamanship demands that you operate your boat quietly so as not to infringe on the rights of others. Don't use the thru-transom exhaust unless you are well off shore.
- You are responsible for any damage or injury caused by your boat's wake. Observe no wake speed zone warnings. Operate your boat with regard for the safety of other boats and people in your boating area.
- Keep your engine well tuned to decrease exhaust hydrocarbon emissions that pollute the air and water.

RETURNING TO SHORE

DOCKING

Always approach the dock slowly. Think before acting. If you are wondering whether your boat will fit in a space against a dock, remember that pilings are often (but not always) spaced 10 feet apart.

Remember that it is easier to control a boat in reverse because a boat steers from the stern. When backing into a slip, back so that bow swings into the wind if possible. You will have more control.

If you have a twin engine boat, center the steering wheel. Use the throttles and shifters to control the boat's movement.

If possible, come in against the wind or current, whichever is stronger. Approach the dock at a 30-45° angle. As the boat nears the dock, slowly swing parallel to it. Tie the bow line first; then the stern.

If wind or current is moving toward the dock, move parallel to the dock further out. Let the wind or current push you in. Tie the stern first, then the bow.

Use extreme caution if wind or current is from your stern. Back in towards the dock slowly at a slight angle with engine in slow reverse. Gently swing parallel. Tie stern first, then the bow.

If the weather looks bad, use spring-lines from the bow and stern to dock amidships of the boat. Tie up on the downwind side of the dock. If the wind is changeable, place fenders over the side between the boat and the dock.

MOORING

After you have positioned your boat next to the dock, you must secure it with mooring lines to keep it in position. Mooring lines must be long enough to secure your boat in any docking situation. For example, the length of the lines for a 16-foot runabout should be at least 15 feet. An eye splice at the end of each line works well with bow or stern cleats.

The mooring lines you will use most often are the bow line, the stern line, and spring lines as shown on **Figure 10.5**. Each line has a specific purpose. The bow line and the stern line secure your boat's bow and stern. The two spring lines keep your boat from moving forward or backward when you are moored alongside a dock.

If you are mooring your boat for a short time, bow and stern lines may be the only lines you will need. If you are mooring your boat for a longer time or the currents are swift, you should use spring lines. The stern spring line leads from the boat's stern cleat forward to the piling or cleat on the dock. The bow spring line leads from the bow cleat aft to the dock.

If you are mooring your boat in a slip, bow and spring lines, port and starboard, will keep your boat in position.

NOTE: If tides are a consideration, be sure to leave slack in the lines to make up for the rise and fall of the water while your boat is docked.

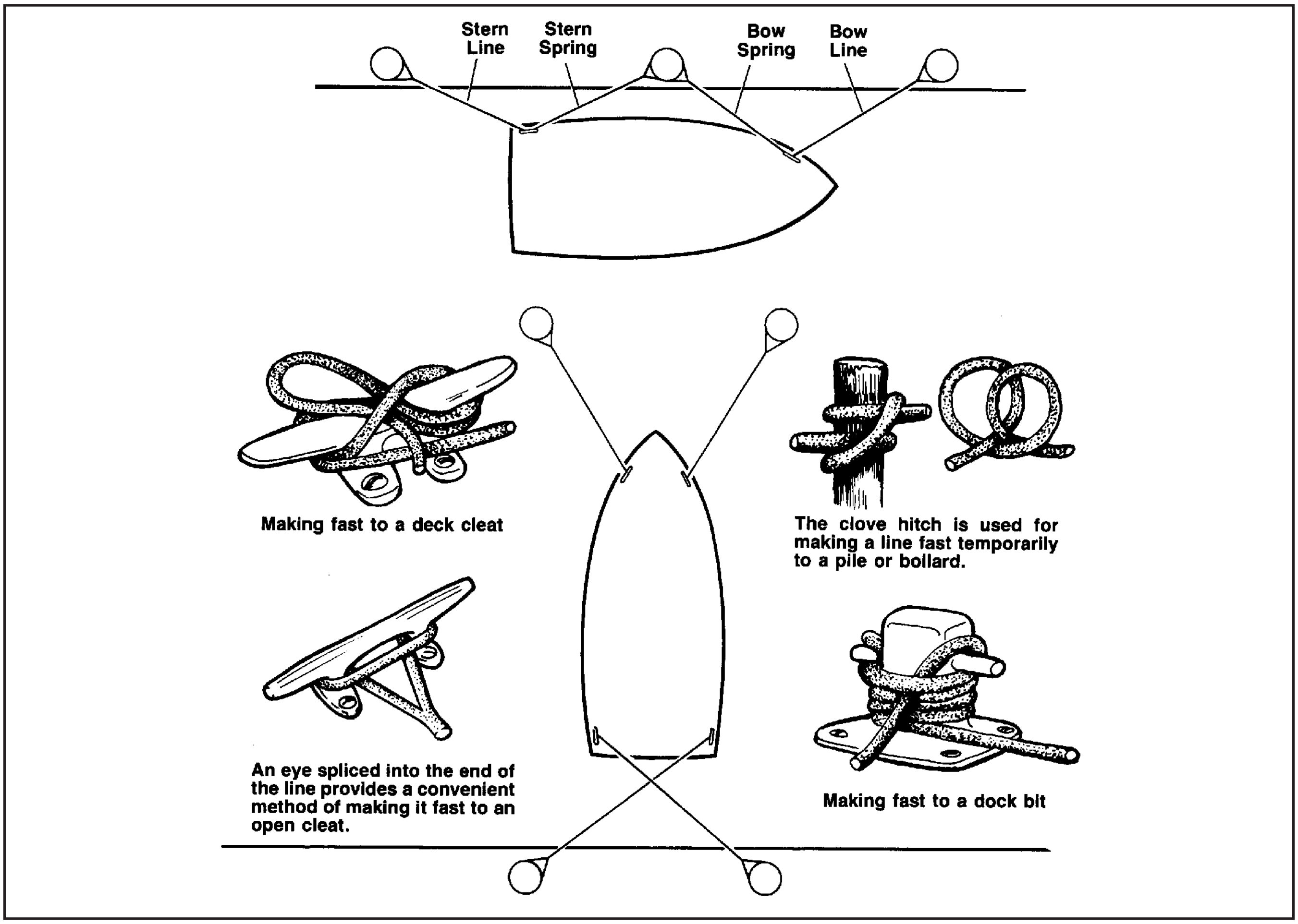


FIGURE 10.5 MOORING LINES

If properly used and maintained, your boat will give you years of use and enjoyment. By keeping your boat "ship shape," you will be doing more than protecting your investment; you will also ensure good performance and safety on the water.

When cold weather has arrived or a change in your boat's usage requires extended storage, we suggest that you use the following guidelines. Special preparations are necessary to prevent damage by rust and corrosion, mildew, discharged batteries, and freezing water. If you live in an area that does not require seasonal storage, we recommend a thorough inspection once a year.

IMPORTANT: Your warranty does not cover damage to your boat if it is not properly stored and winterized. We recommend that, at a minimum, you check with your dealer about proper winterization procedures. Better yet, have your dealer prepare your boat for storage for you.

LIFTING THE BOAT

Unless your boat is trailerable, have your dealer or qualified marina personnel lift your boat out of the water for you. Each boat has main frame components designed to support the boat when it is being lifted out of the water. Severe gelcoat crazing or more serious hull damage can occur if the lifting slings exert pressure on the gunwales. Flat, wide belting-type slings should be used. Don't use cable-type slings. The spreader bar at each sling should be as long as the distance across the widest point the sling surrounds.

- Never hoist the boat with more than a minimal amount of water in the bilge.
- Empty fuel and water tanks, especially if they have large capacities.
- Larger boats that are not normally trailerable have sling placement labels on the sides of the boat. Be sure to position slings as indicated by the labels.
- Do not place the slings where they may lift on the propeller shaft or underwater fittings.
- Do not use deck cleats or bow or stern eyes for lifting unless they are labeled.

CRADLE

A cradle is the ideal support for your boat whenever it is not in the water. Properly designed and located, the cradle will support the boat under the main frames. Support at these points is essential for preventing damage to the hull. Purchase a cradle from your dealer to ensure that your boat has the correct support.

PREPARATION FOR STORAGE

Remove the bilge drain plug immediately after taking the boat out of the water. Store the plug in a plastic bag and tape it to the throttle control lever so that it can easily be found.

After washing the boat, raise the bow out of the water high enough to allow as much water as possible to drain while you are completing other storage preparations. Before covering your boat, apply a coat of Meguiar's Boat/RV Wax to prevent excessive oxidation.

TRAILER

Perform the following steps to winterize your trailer for storage.

- Check tire inflation.
- Clean and repack the wheel bearings. Make sure there is no water in the wheel hubs. Inspect the bearings and races for pitting. Inspect the grease seals for wear. Replace if necessary and fill the bearings with grease.
- Examine the entire trailer and running gear for signs of cracking or metal fatigue. Repair weld cracks, and tighten any loose bolts and screws.
- Check the frame. Make sure there are no signs of bending or swaying due to overloading.
- Repair or replace worn or misadjusted bunks or rollers.
- If rust has formed on the trailer, remove it by sanding and paint the bare spots to match the trailer.

- Inspect and adjust the brake system according to the manufacturer's recommendations. Look inside brakes for excessive rust.
- Lubricate the winch, the coupler, all rollers and pivot points.
- Check the safety chains.
- Inspect the winch and fastening hook for wear.
- Check tie-downs for fraying. Loosen or remove tie-downs.
- Check the electrical system for wear or loose connections, and repair if necessary.
- Open tail light lenses and inspect bulbs and sockets for excessive rust and corrosion. Coat metal base of bulb with a die-electric grease or spray with WD-40.
- If storing your boat on a trailer, make sure that the trailer supports are aligned with the structural members of the hull. Distribute the weight properly. Make sure your boat is well supported across the transom and keel.
- Put the rig on blocks or else move the trailer from time to time to prevent flat spots on the tires.
- Position your boat's bow to allow water to drain via the transom drain. Do not allow rain water to collect inside the boat.
- If it is possible for water to accumulate on the boat covers, poke a small hole near the back of your boat cover canvas. Prepare the hole with a grommet to prevent tearing. If your boat is tilted backwards, rain water will run through the hole and out the bilge drain hole.

HULL

- If your boat is going to be placed in dry storage, as soon as the boat is hauled out, scrape off any barnacles and other growth if necessary. Scrub the hull and deck thoroughly to remove marine growth and scum. (The hull is easiest to clean when the boat is first hauled out and while the adhering material is still wet.)
- Inspect the underwater gear and propellers for excessive wear or damage.

DECK

- Wash the deck, superstructure, and/or cockpit, clean all chrome and coat with a rust inhibitor before storing.
- Clean the indoor/outdoor carpet.

ENGINE, SYSTEMS & COMPONENTS

ENGINE AND OUTDRIVE

Have your dealer prepare the engine and outdrive for winter storage. Your dealer will service the cooling system as part of the engine winterization. Special skills, tools, and equipment are required.

IMPORTANT: In regions where temperatures fall below freezing, all water in the engine must be removed or replaced with a marine antifreeze solution before storing your boat for the winter. Mix antifreeze according to label directions for the lowest expected temperature. Use non-toxic antifreeze to prevent damage to the environment. Failure to do so will seriously damage the engine. Freeze damage is not covered by the warranty. Make sure your boat's engine is slightly bow up during the extended storage period.

FUEL SYSTEM

Fill the fuel tank to minimize condensation. If tank is completely filled, fuel may overflow from the tank during weather. Help prevent damage to the environment. Leave enough space for fuel to expand. Add a gasoline stabilizer solution to the fuel prior to storage. Follow the stabilizer manufacturer's recommended procedure.

BATTERIES

> ⚠ **WARNING**
>
> **To prevent personal injury, wear goggles, rubber gloves and a protective apron when working with battery. Battery electrolyte can cause severe eye damage and burns to the skin. In case of spillage, wash area with a solution of baking soda and water.**

When working on or around battery connections, do not allow metal tools or loose wires to contact terminals. Contact across positive (+) and negative (-) terminals will cause a short circuit. Electrical burns or personal injury may result.

- Remove the batteries. Check water level and store away from freezing temperatures.

IMPORTANT: Batteries should be stored in a cool, dry place.

- Clean outside battery case, terminals and battery clamps with a solution of baking soda and water.

NOTE: Do not allow baking soda/water solution to enter the cells.

- Lightly sand battery posts and clamps with fine grit emery cloth.
- Apply a light coat of petroleum jelly to cover the end of the battery cables.
- A monthly recharge or continuous trickle charge should be applied to the battery during storage.

FRESH WATER SYSTEM

Water must be removed from the fresh water system to prevent damage to system components during cold weather.

1. Turn on fresh water pump.
2. Open faucets and allow pump to empty fresh water tank.
3. Close faucet when tank is empty. Shut off water pump.
4. Mix nontoxic antifreeze in accordance with manufacturer recommendations and add to fresh water tank. The amount of antifreeze mixed should be equivalent to the capacity of the water heater plus approximately 2 gallons.

Note: Nontoxic antifreeze in fresh water tank will also be needed to winterize head and macerator.

5. Turn on water pump.
6. One by one, open each cold water faucet and fresh water outlet beginning with the one furthest from the water tank. Close faucet or outlet when antifreeze starts to flow. (See icemaker manual for winterization instructions.)
7. One by one, open each hot water faucet beginning with the one furthest from the water heater. Close faucet when antifreeze starts to flow.
8. Winterize remaining system components such as shower and icemaker. (See icemaker manual for winterization instructions.)
9. Shut off water pump

VACUFLUSH® SYSTEM

The fresh water system must be winterized before winterizing the waste system. Refer to the VacuFlush System manual for additional information.

1. Have holding tank pumped out at an approved pumpout station.
2. If necessary, add nontoxic antifreeze to fresh water tank. Mix antifreeze in accordance with the manufacturer's recommendations.
3. Operate head until antifreeze flows into bowl. *Allow sufficient time between flushes for vacuum to build up before flushing.*
4. Operate macerator until antifreeze flows through discharge fitting on side of hull. Flush head as needed to provide enough antifreeze to winterize macerator.
5. Dispose of antifreeze according to manufacturer's instructions.

RAW WATER SYSTEM

Water must be drained from the raw water system to prevent damage to seacock and water lines.

1. Locate hose that connects raw water pump with raw water through hull pickup fitting, and close seacock.
2. Disconnect hose at the point that it connects with the through hull fitting.
3. Mix one gallon of non–toxic antifreeze mixed in accordance with the manufacturer's recommendations. Place end of hose in antifreeze.

Attach a hose to the cockpit washdown hose connector.

4. Position an empty container to catch the flow of antifreeze from cockpit hose.

5. Operate raw water system pump by turning on the raw water washdown switch at the helm.

6. When antifreeze flows through hose into container, shut off pump.

7. Repeat for foredeck washdown.

8. Reconnect the hose to the through hull fitting, and close the seacock.

9. Dispose of unused antifreeze according to manufacturer's instructions.

10. After boat has been lifted from water, open seacock so water can drain from valve. *Do not open seacock while boat is in the water*.

IMPORTANT: During commissioning, be sure to close raw water system seacock before lowering your boat into the water.

RAW WATER HOSES

Water must be drained from engine cooling lines to prevent damage to seacock, sea strainer, and hoses. Refer to the engine manufacturer's manual for detailed engine winterization procedures.

1. Open seacock valve and allow water to drain.

2. Disconnect hose at engine and lift hose up so water drains from hose.

3. Open petcock at bottom of sea strainer and allow water to drain. Have a suitable container to catch water as it drains from seacock.

4. If your boat is out of the water, leave seacock open and hose disconnected.

IMPORTANT: During commissioning, be sure to close engine seacocks and connect hoses before lowering your boat into the water.

AIR CONDITIONING SYSTEM

Water must be drained from air conditioning lines to prevent damage to seacock, sea strainer, and air conditioning system components. Refer to the manufacturer's manual for detailed winterization procedures.

1. Open seacock valve and allow water to drain.

2. Close seacock. Seacock must remain closed while winterizing the air conditioning system.

3. Open sea strainer by unscrewing wing nuts on top of the strainer housing. Remove screen.

4. Mix 2-3 gallons of nontoxic antifreeze according to manufacturer's directions.

5. Fill sea strainer housing with antifreeze.

6. Operate air conditioning pump. Refill sea strainer with antifreeze as level in strainer goes down.

7. Continue to operate pump until antifreeze flows out of thru–hull fitting.

8. Shut off air conditioning pump.

9. Close sea strainer and tighten wing nuts.

10. Open seacock to allow any water trapped in valve to drain. If your boat is out of the water, leave seacock open.

11. Dispose of unused antifreeze according to manufacturer's instructions.

IMPORTANT: During commissioning, be sure to close air conditioning seacock before lowering your boat into the water.

SEACOCKS

Seacocks and sea strainers are normally winterized as part of winterizing the equipment and systems they serve. When winterization is complete, check to make sure that water is drained from all seacocks and sea strainers. Water freezing in valves or sea strainer can damage those components.

When your boat is out of the water:

1. Open seacock and allow water to drain.

2. Open petcock at bottom of sea strainer and allow water to drain.

3. Leave seacocks open.

IMPORTANT: During commissioning, be sure to close all seacocks and sea strainer petcocks before lowering your boat into the water.

INTERIOR CLEANING

- Scrub all interior surfaces including cupboards, cabinets and drawers.

- Be sure to remove everything that can hold moisture and cause mildew. Remove and store OFF the boat all cushions, mattresses, curtains, blankets, sheets, pillows, towels and clothing.

- If it is necessary to store cushions on board, open all zippers and lift cover away from the foam padding by placing a small plastic bowl or other round blunt object inside the cushion to allow for adequate air circulation. Seats that can be, should be stored in the down or folded out position.

- Make sure the cabin is well-ventilated.

- PFD's and other safety equipment must be cleaned and dried. If left on board, place them where air can circulate around them.

- Clean and thoroughly dry the bilge area. Remove all rags, sponges or other cleaning materials from bilge area.

- Allow the interior to completely air out for a couple of days, weather permitting.

- If you store your boat outside, we recommend that you do not store it with the bimini top raised. Cover with a storage cover, tarp or plastic (available from your dealer) especially if you live in an area where heavy snow is possible. Whatever material you use as a cover, be sure the boat is properly ventilated.

NOTE: After cleaning, make sure everything is thoroughly dry and air can circulate freely throughout the inside of your boat.

STORAGE ON TRAILER

- Loosen all tie-downs to relieve the stress on the hull.

- Place blocks under the axles to keep tires off the ground.

- Re-pack the trailer wheel bearings. Water may be trapped inside the bearings. (Your dealer can help you do this.)

- Store with the bow up and remove the drain plug to allow for any excess water to drain.

RECOMMISSIONING THE BOAT AFTER STORAGE

- Inspect the fuel system and all associated equipment for proper connections, corrosion, leaks or other damage. Always be aware of any odor of fuel vapors.

IMPORTANT: For detailed information concerning recommissioning of the engine, refer to your engine manual.

- Charge and install battery(s) in boat.

- Inspect all battery wiring. Repair or replace if necessary.

- Before lowering your boat into the water, be sure to close all seacocks. Check sea strainer petcocks and close if open.

- Attach the battery cables and tighten the cable clamps.

IMPORTANT: Do Not apply petroleum jelly or marine grade grease before connecting and tightening clamps.

- Apply petroleum jelly or marine grade grease on posts and clamps to eliminate air pockets and acid build up after clamps are tightened.

- Check engine compartment and bilge for signs of nesting animals and clean as necessary.

- Check entire engine for cracks/leaks caused by freeze damage.

- Coat hull drain plug threads with petroleum jelly and reinstall drain plug.

- Clean the bilge area.

- Inspect all exhaust connections for carbon monoxide leakage. Adjust and repair as required.
- Test the navigational lights and all other lighting on board.
- Inspect all wiring for fraying, wear, loose connections and other damage.
- Inspect all switches, controls and other related equipment for proper operation.
- Inspect all safety equipment for proper operation and physical condition.
- Open all faucets and fill freshwater holding tank with water. Turn freshwater pump on to allow water to flow through faucets until all antifreeze is flushed out and the water runs clear, then close faucets. Fill the freshwater tank until full, then check the entire system for water leaks.
- Launch the boat and start the engine. It may take a minute of cranking to allow the fuel system to prime. When the engine starts, keep a close watch over the gauge readings and check for leakage and abnormal noises. Keep speeds low until the engine has reached normal operating temperature. If your engine was fogged for winterization, you will see exhaust smoke for a few minutes while the fogging oil is burned off.

Refer to engine and boat accessory manuals for further recommissioning instructions.

This section contains information that requires use and disposal of oils, fuels, and chemicals. Pay particular attention to the environment during the use and disposal of these materials.

We recommend that maintenance and repairs be performed by your dealer. However, some owners may prefer to take care of routine maintenance and repairs themselves. For those individuals, this section includes general information and basic procedures. Keep a record of all completed work in the Maintenance/Service Log. A copy of this log is in Section 1.

This section also includes recommendations for cleaning fiberglass, hardware, fabrics, vinyl, and carpeting. Although household cleaners may be used, they should be used in small quantities. Cleaners containing chlorine, solvents, or petroleum may damage boat components and are a pollutant if they get into the water. In addition, cleaners containing phosphates encourage algae blooms. Mixing cleaners can cause harmful chemical reactions. Use citrus–based cleaners or the cleaners recommended. Check with your dealer for additional information about cleaners.

IMPORTANT: Check with your dealer before beginning any maintenance or repair if you are not sure about the proper tools, equipment and supplies to be used. Always refer to the manufacturers' manuals for detailed maintenance and repair procedures.

SERVICE SCHEDULE

The manufacturer of each system or component in your boat should provide a recommended service schedule, listing items requiring routine attention, type of maintenance, and frequency.

The service schedule is a guide based on average operating conditions. Under severe operating conditions, shorten service intervals.

DAILY (EACH USE)

- Inspect your stern drive for damage. If a propeller is damaged, have it repaired or replaced.
- Inspect the hull for gelcoat damage. Have your dealer repair gelcoat damage as soon as possible.
- Check fluid levels in batteries and clean terminals with a wire brush if corroded.
- Inspect zinc anodes for deterioration and replace if 50% or more of the anode is deteriorated.
- Inspect the steering for looseness or binding and perform service in accordance with steering system manufacturer's recommendations if required.
- Inspect and clean sea strainers regularly. The frequency of cleaning will vary depending on the amount of use and local conditions. To clean the strainer, close the seacock and unscrew the wing nuts on top of the strainer housing **(Figure 12.1)**. Remove screen and wash. After replacing the screen, replace and tighten the wing nuts. Open the seacock and check for leaks.

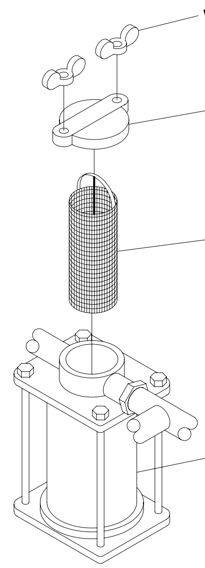


FIGURE 12.1 SEA STRAINER

- Wash down you boat with fresh water and wipe down with a cotton towel or chamois. If you used your boat in salt water, this washdown is especially important!

- Flush engine (sterndrives) with fresh water to clean out sand and salt. Make sure bow is higher than engine to prevent water from backing up into engine. See your dealer for attachments that allow flushing engine with a garden hose.

  While flushing, run engine approximately 10-15 minutes. *Observe engine multi-function gauge to make sure engine does not overheat. Be sure that flushing hose remains attached to outdrive.*

- While cleaning engine compartment, inspect all belts and hoses for deterioration. Make sure clamps are tight.

EVERY 100 HOURS OF OPERATION OR SEMIANNUALLY

- Inspect the engine and stern drive mounting hardware for tightness.
- Clean the engine flame arrester and ventilation hoses.
- Clean and polish the hull bottom using a marine recommended cleaner and wax.
- Inspect the bilge pumps and float switches. Float switches gradually lose sensitivity due to an accumulation of bilge oil on the operating surfaces. Remove and clean or replace the float switches periodically.
- Clean and inspect the entire bilge. Dirt in the bilge will accumulate, soak up oil and eventually become a fire hazard, so keep your bilge clean. See your dealer for environmentally safe bilge cleaners.
- Visually inspect all electrical connections for chafing and corrosion and tighten connections if they are loose.
- Carefully inspect all lifesaving equipment (PFDs) for cut or torn fabric and other signs of deterioration and replace if necessary.
- Carefully check hull for cracks and contact your dealer if you suspect damage has occurred.
- Check the entire fuel system for any evidence of line deterioration or fuel leaks. If any suspicious lines or connections are discovered, have them repaired or replaced before going out on the water.

ANNUAL MAINTENANCE

- Have a qualified technician thoroughly inspect your entire electrical system, including performing a leakage test of each circuit.

ENGINE EXHAUST SYSTEM

The exhaust system collects engine combustion gases and exhausts them through fittings at the stern. The hydrocarbons in engine exhaust are pollutants. A well–tuned engine operating at its best engine reduces air and water pollution by exhausting fewer hydrocarbons.

⚠ WARNING

Exhaust gases contain carbon monoxide. Carbon monoxide is poisonous and can cause unconsciousness or death. Shut down engines immediately if any exhaust leaks are detected.

Visually inspect the engine and generator exhaust systems (hoses, joints, manifolds, etc.) for leaks. Make sure all clamps are tight. Check hoses and exhaust boxes for damage. Replace any damaged exhaust system component.

Do not remove or bypass mufflers. Local regulations may establish maximum noise limits.

Note: Any discoloration around a joint or gasket usually indicates a leak.

SALTWATER CORROSION

The entire boat should be rinsed with fresh water immediately after a cruise in salt water. If the boat is used primarily in salt water, wax the hull monthly and apply corrosion inhibitor to all hardware. See your dealer for products suitable for the marine salt water environment. Fresh water internal flushing is recommended when used in salt, polluted or brackish waters. Recommended products include Meguiar’s One Step Cleaner/Wax.

BOTTOM MAINTENANCE

IMPORTANT: If your boat will be in water continuously, we recommend sealing the bottom of the hull with a high quality barrier coating. Unsealed gelcoat may form water blisters. Repair of water blister damage is not covered under the warranty. If required, contact your dealer for further information.

The best way to prevent blistering is to minimize the amount of time the boat remains in the water. If the boat must remain in the water, the application of a “blister guard” system to the hull below the waterline will lessen the possibility of blistering. The application of blister guard will decrease the maximum speed of your boat. Proper application is essential; contact your dealer or marine service center for additional information.

We recommend your boat be removed from saltwater and rinsed after each use to prevent unwanted marine growth on the hull and to maintain ultimate high performance. The bottom of your boat must be kept clean! Any buildup of marine life from water will create drag and affect the boat’s performance and efficiency. Never use brushes or scouring pads on the bottom of your boat, as this can cause small scratches that will actually trap in dirt.

Antifouling bottom paint is designed to dissolve slowly to prevent marine growth. Therefore, the hull bottom should be repainted at the beginning of the boating season. Factors to take into consideration when selecting a protective bottom paint are water temperature, pollution, salinity, current and organic material in the water.

IMPORTANT: Consult with your dealer for recommended bottom paints and local laws that govern your area. Many states regulate the chemical content of bottom paints to meet environmental standards and regulations. Contact your dealer for information.

1. Scrub hull bottom with a bristled brush and mixture of soap and water.

NOTE: Repainting the hull bottom is not required after each scrubbing unless bare areas are visible in the bottom paint.

2. Sand entire bottom surface of boat.

3. Smooth out all rough areas as required.

4. Clean bottom surface to remove all dust and foreign materials.

5. Make sure bottom surface is completely dry.

6. Apply new coat of bottom paint.

NOTE: Always follow manufacturer’s procedures and recommendations concerning application of paint and drying time before putting your boat in the water.

PROTECTION AGAINST ELECTROLYSIS

IMPORTANT: It is the boat owner’s responsibility to periodically inspect and replace the sacrificial zinc anodes. Damage resulting from electrolytic corrosion is not covered by the warranty.

Sacrificial zinc anodes, installed by the dealer or the engine manufacturer, protect the hardware that is exposed to the water. Electrolysis attacks the softest or least noble metals first. Because zinc is a less noble metal, it will decompose before the more noble metals. Check these zinc anodes periodically and have them replaced as required. See your dealer for parts and service.

Zinc is also used to protect metal that is exposed to saltwater. The salt causes a galvanic action that decomposes metals.

DECK AND HULL CARE

⚠ CAUTION

Waxed gelcoat surfaces can be very slippery. Do not wax normally used portions of the floor deck or gunwales. Do not wax any textured or non-skid surfaces such as floors, walkways, steps or ladders.

IMPORTANT: Keep fiberglass surfaces clean to prevent dirt from scratching and dulling the finish. Wash down with a mild soap (dish detergent or car wash soap) and plenty of clear water, especially if your boat has been exposed to salt water.

The finish on your boat is made of highly durable marine gelcoat. With proper care, this finish will last for many years, retaining its lustrous appearance. For added protection you can have the hull of your boat coated with an antifouling paint. See your dealer for further information.

Routine, periodic cleaning is the only practical way to keep the surface of your boat looking shiny and new. Keeping your boat in showroom condition means greater personal satisfaction and higher resale value. Special cleaning products are available from your dealer to remove mildew. Boats left outdoors will gradually deteriorate from exposure to sunlight, water, dust and chemicals in the air. Outdoor exposure may

cause your boat's surface to show a variety of changes, including:

- Chalking (fine, powdery whiteness on the surface)
- Fading (gradual loss of color)
- Yellowing
- Loss of gloss

Darker colors tend to exhibit these changes more rapidly than light colors because they absorb more of the sun's rays (ultraviolet and infrared).

⚠ CAUTION

Wire brushes, scouring pads or other abrasive type materials/solutions should never be used on the deck or hull of your boat. They create small scratch marks that will collect marine growth and other foreign materials.

NOTE: Before using a particular cleaning solution or method for cleaning, it is a good idea to test the material to be cleaned in a hidden or inconspicuous area for possible adverse reactions.

The deck and hull can be easily cleaned with Meguiar's Marine Boat Gel Wash and water (with the exception of oil or heavy grime). Use a clean cloth or sponge. Dirt, sand, or grit in a dirty rag could scratch the gelcoat surface. DO NOT USE abrasives to clean your boat.

Boat surfaces, even textured walkways and steps, can be very slippery when covered with soap suds. Use caution to protect yourself and others from slips and falls. Wear deck shoes or boat shoes whenever you are in your boat.

After you have thoroughly cleaned your boat, you are ready for a wax application to bring back the original sheen of your hull. If the deck or hull has oxidized (appearing as a light white milky film), you may want to use Meguiar's Heavy Duty Oxidation Remover or Mirror Glaze Color Restorer before waxing. It is a good idea to wax your boat at least twice a year. In southern climates, waxing more frequently may be necessary to protect the boat from the sun's rays.

NOTE: Do not use a spray wax. Wax accidentally sprayed on nonskid surfaces will make them very slippery.

If nonskid or textured surfaces on decks, walkways, and steps become stained, clean them with a bristle brush and a bathroom fiberglass cleaner. *Be careful! Scrubbing smooth gelcoat surfaces with a bristle brush may scratch the gelcoat.*

Keeping both the interior and exterior of your boat in good condition and inspecting your boat regularly to keep minor problems from becoming major ones are good rules of thumb for proper boat care. REMEMBER, A BOAT KEPT IN NEARLY NEW CONDITION, REGARDLESS OF AGE, RETAINS A HIGH RESALE VALUE.

FIBERGLASS REPAIR

Although your deck and hull have been designed to withstand normal use, it is inevitable that surfaces will become scratched or chipped over a period of time. Superficial scratches can usually be rubbed out with Meguiar's Heavy Duty Oxidation Remover.

"Hairline cracks" or "spider webbing" may develop in the gelcoat surface of a hull or deck. This can be caused by weathering, impact or other factors. Small blisters or gouges may also occur through normal wear. These do not affect the strength of the hull or deck and can easily be repaired by you or your dealer.

The affected area should be chipped or sanded away and a thin layer of color-matched gelcoat applied. This layer is then sanded smooth and buffed back to its original luster. Your dealer can obtain color-matched gelcoat and provide further instructions from the manufacturer.

Fiberglass hulls are tough, but like hulls of any other materials, they can be damaged. A fiberglass hull has virtually no internal stresses. Thus, when a part is broken or punctured, the rest of the hull retains its shape. A severe blow will either be absorbed or result in a definite, localized break. In the case of a break of this nature, the boat should be returned to your dealer for repair.

You will need the following items for minor repairs:

- Gelcoat
- DDM (clear liquid catalyst)
- Putty knife or equivalent
- Razor blade
- Fine sandpaper (400 to 600 grade)
- Wax paper (piece big enough to cover repair)

⚠ WARNING

Gelcoat and fiberglass resin are flammable; work in well-ventilated area free from any fire hazard.

For minor repairs follow this procedure:

1. Clean the area to be repaired and clear it of wax and oil.

2. Thoroughly clean out nicks, chips and scratches.

3. Sand area to be repaired so gelcoat will bond.

4. IN A SEPARATE CONTAINER, MEASURE ONLY THE AMOUNT OF GELCOAT YOU NEED. Mix a 2% ratio of catalyst to the amount of gelcoat being used (a spoonful of gelcoat will require only a drop or two of catalyst).

NOTE: DO NOT pour any unused portions of the gelcoat/catalyst mixture back into either original container.

5. Apply gelcoat to area leaving a slight lift above the surface.

6. Cover with wax paper (lack of oxygen helps mixture set) and let set 20 to 30 minutes.

7. Remove wax paper and shave off excess gelcoat with a razor blade.

8. By the time the area is shaved smooth, you are ready to sand (Use 400 to 600 grade sandpaper, NO SUBSTITUTES.)

9. Rub or buff the fiberglass with Fiberglass Cleaner/Compound, then polish, then wax.

Some discoloration may occur if your boat has weathered. For your first attempt at repair, experiment on an area not normally visible. With a little experience, even the novice can repair a scratch with few, if any, visible repair marks.

HARDWARE AND FITTINGS

Chrome, stainless steel and aluminum hardware should be cleaned with Meguiar’s All Metal Cleaner, followed with an application of Meguiar’s All Purpose Metal Polish.

AVOID THE USE OF DETERGENTS OR ABRASIVES WHEN CLEANING HARDWARE.

Inspect all hardware and fittings to make sure they are secure. All screws, bolts, clamps, cleats, etc., must be tight.

UPHOLSTERY

Your boat’s seats and vinyl upholstery should be kept as clean as the exterior finish to prolong life and beauty.

SEAT COVERINGS & VINYL

The seat coverings and vinyl trim are made of temperature resistant vinyl.

1. Always try to clean up spills quickly to prevent staining.

2. Clean dirt and smudges with Meguiar's Vinyl & Rubber Cleaner/Conditioner. If necessary, scrub with a soft bristle brush to remove dirt from textured vinyl. Dry with a soft, lint-free cloth or towel.

3. Use a stronger detergent such as Meguiar’s Heavy Duty Vinyl Cleaner for tough stains. Follow the instructions on the bottle label for ground-in dirt, a nylon brush can be used to scrub out stains.

Certain household cleaners, powdered abrasives, steel wool and industrial cleaners can cause damage and discoloration and are not recommended. Petroleum-based cleaning products such as dry cleaning fluids and lacquer solvents should not be used, as they will remove the printed pattern and gloss. Waxes should be used with caution. Many contain dyes or solvents that can permanently damage the protective coating.

4. Suntan oil will damage vinyl upholstery. Use suntan lotion instead of suntan oil.

5. Removable outside seat cushions should be placed inside when not in use.

Exposure to the sun is the enemy of all upholstery materials. For maximum life, we recommend keeping them covered with a cockpit or full length cover when you are not using your boat.

INTERIOR FABRICS

Treat the fabric upholstery the same as home fabric upholstery. Vacuum and shampoo to maintain upholstery and to keep it clean and odor free. Spray with Lysol™ or other disinfectant to prevent the build up of mildew.

WINDSHIELDS AND WINDOWS

Safety glass windows and windshields may be cleaned just like those in a car. Plastic and Plexiglass surfaces require special attention. Flood acrylic windshields and port windows with plenty of clean warm water. Use a soft clean cloth. Rinse with clear water.

> ⚠ **CAUTION**
>
> **Do not use window cleaning sprays, scouring compounds or solvents to clean plastic windows. Scouring compounds will scratch the windows. Sprays and solvents penetrate the surfaces and cause hazing which will obstruct visibility.**

Vibration may loosen windshield fasteners and braces during normal use. These should be checked periodically for tightness.

CARPETING

EXTERIOR

Scrub indoor/outdoor carpeting with a brush using mild detergent and warm water, then thoroughly rinse with clear water. Allow carpet to dry completely before use. Apply a light coating of Scotch Guard to protect against accidental spills.

INTERIOR

Vacuuming and occasional carpet shampoo are recommended for extended life and appearance. Apply a light coating of Scotch Guard to protect against accidental spills.

CANVAS

Canvas or “bimini tops” are designed to protect the helm seating areas from the sun. Although these tops are intended to provide ample weather protection for the helm, they are not completely weather tight like a winter storage cover.

To keep exterior seat cushion foam from getting wet, we recommend that the cushions be removed and properly stored when not in use unless the boat is fitted with a full length cover.

CLEANING

IMPORTANT: Do not use hot water, dry in an automatic dryer, dry clean or steam press canvas.

1. Wet down all canvas. Use a soft bristle brush and scrub with a mild detergent and water solution.
2. Use a mild solution of ammonia/water and scrub for heavy soil or mildew build up. Be sure to rinse thoroughly.
3. Brush or sweep underside of the top. Spray with Lysol™ or other disinfectant to prevent mildew.

CARE

1. Care for vinyl-coated canvas as you would vinyl upholstery.
2. Lubricate zippers with paraffin and snaps with petroleum jelly.
3. If a leak occurs along a canvas seam, rub with paraffin or apply a light coating of Scotch Guard®.
4. Air dry all canvas material before storing. Never store canvas while damp or wet and provide proper ventilation to prevent mildew.
5. Avoid mooring under trees.
6. Never tow your boat with the top up.
7. When not in use, remove the top and store in the boot on board your boat.

Nautical Glossary – 14

Abaft
Toward the stern.

Abeam
Amidships, at a right angle to the keel.

Aboard
On, in, or into a boat.

ABYC
American Boat and Yacht Council, Inc., the organization that sets voluntary safety and construction standards for small craft in the USA.

Adrift
Without motive power and without anchor or mooring.

Afloat
On the water.

Aft
Describing the after section of a vessel, or things to the rear of amidships and near the stern.

Aground
Touching bottom.

Amidships
In the center, the center portion of a vessel.

Anchor
A forging or casting shaped to grip the sea bottom and, by means of a cable or rope, hold a boat in a desired position.

Anchorage
A customary, suitable and (usually) designated harbor area in which vessels may anchor.

Astern
Toward the stern. An object that is aft of a boat is said to be astern of the boat.

Athwart
Across.

Aweigh
Off the bottom, said of an anchor.

Aye
Yes, while aboard a boat or ship. Means "I understand."

Bail (Bale)
To remove water from a boat by pump or bailer.

Ballast
Heavy material such as iron, lead, or stone placed in the bottom of the vessel.

Beacon
A post or buoy placed over a shoal or bank to warn vessels, also a signal mark on land.

Beam
Imaginary line amidships at right angles to keel of vessel. Also vessel's width amidships.

Bearing
The direction or point of the compass in which an object is seen.

Belay
To make fast to a cleat or belaying pin; to cancel an order.

Below
Beneath, or under, the deck. One goes below when going down into the cabin.

Bend
To fasten by means of a bend or knot.

Berth
A position, as a place to sleep or in which a vessel maybe made fast; a margin of safety, as "a wide berth."

Bilge
The lower internal part of a boat's hull.

Bollard
A strong post for holding lines fast.

Bow
The forward part or front of the boat.

Breakers
Waves cresting as they reach shallow water, as at or on a beach.

Breakwater
A structure, usually stone or concrete,built to create a harbor or improve an existing one.

Bulkhead
Vertical partition in a boat.

Burdened Vessel
Former term for the vessel which must stay clear of vessels with the right-of-way.

Calking (Caulking)
Forcing filler material into the seams of the planks in a boat's deck or sides, to make them watertight.

Camber
The arch of a deck, sloping downward from the center toward the sides.

Capsize
To turn over.

Carburetor Backfire Flame Arrestor
Required equipment on all motorboats except outboards and diesels. Reduces chance of fire caused by backfires in internal combustion engines.

Cardinal Points
The four main points of a compass; north, east, south, and west.

Ceiling
The inside lining of the hull.

Certificate
Government paper, such as a boat's license.

Chart
A map of a body of water that contains piloting information.

Chine
The intersection of sides and bottom of a boat.

Cleat
A piece of wood or metal with projecting ends to which lines are made fast.

Clinker
A method of planking in which the lower edge of each strake overlaps the upper edge of the strake next below. (Also called lapstrake.)

Coaming
A raised edge, as around part or all of a cockpit, that prevents seawater from entering the boat.

Coast Guard
The federal marine law enforcement and rescue agency in the US.

Cockpit
A well or sunken space in the afterdeck of a small boat for the use of the helmsman and crew.

Companionway
A hatch or entrance, from deck to cabin.

Compass
The instrument which shows the heading of a vessel.

Cowls
Hooded openings used for ventilation.

Cradle
A frame used to support a vessel on land.

Current
The movement of the water in a horizontal direction.

Deadrise
The rise of the bottom of a midships frame from the keel to the bilge.

Deck
Any permanent covering over a compartment.

Deep-six
To discard or throw overboard.

Depth Sounder
An electronic depth-finding instrument, measuring the time a sound wave takes to go from the vessel to the bottom and return, then displaying the result in feet, fathoms, or meters.

Dinghy
A small, open boat.

Displacement Hull
Type of hull that plows through the water even when more power is added.

Dock
An enclosed or nearly enclosed water area; all the port installations; a place where vessels can moor, as a pier, wharf, or floating dock.

Documented Vessel
Vessel registered with the U.S. Coast Guard.

Dolphin
A small group of piles, in the water, generally used for mooring or as a channel marker.

Draft
The depth of the vessel below the water line, measured vertically to the lowest part of the hull.

Dunnage
Mats, boughs, pieces of wood, or other loose materials placed under or among goods carried as cargo in the hold of a ship to keep them dry and to prevent their motion and chafing; cushioning or padding used in a shipping container to protect fragile articles against shock and breakage; baggage or personal effects.

Ebb
An outgoing tide.

Estuary
An inlet or arm of the sea.

Fathom
Six feet.

Fenders
Objects placed along the side of the boat to protect the hull from damage.

Flare
The outward spread of the boat's sides from the waterline to the rail at the bow. Also, a pyrotechnic signalling device that can indicate distress.

Fore
Used to distinguish the forward part of a boat or things forward of amidships. It is the opposite of aft or after.

Forward
Toward the bow.

Frame
Ribs of the hull, extending from the keel to the highest continuous deck.

Freeboard
The vertical distance measured on a boat's side from the waterline to the gunwale.

Galley
The kitchen area of a boat.

Gimbals
Swivels used to keep equipment level.

Give-Way Vessel
The one which must stay clear of vessels which have the right-of-way.

Grab Rail
A convenient grip, on a cabin top or along a companion ladder.

Gunwale (pronounced gunnel)
The upper edge of a boat's side.

Harbor
A safe anchorage, protected from most storms; may be natural or man-made, with breakwaters and jetties; a place for docking and loading.

Hatch
An opening in a boat's deck for persons or cargo to go below.

Head
A marine toilet.

Headway
Forward motion of a vessel through the water.

Helm
The wheel or tiller by which a ship is steered.

Holding Tank
Storage tank for sewage, so that it will not be pumped overboard into the water.

Hull
The body of a boat.

Hypothermia
A physical condition where the body loses heat faster than it can produce it.

Inboard
More toward the center of a vessel; inside; a motor fitted inside the boat.

Inland Rules
Rules of the road that apply to vessel operation in harbors and certain rivers, lakes, and inland waterways.

Intracoastal Waterways
ICW: bays, rivers and canals along the coasts (such as Atlantic and Gulf of Mexico coasts), connected so that vessels may travel without going into the open sea.

Jetty
A structure, usually masonry, projecting out from the shore; a jetty may protect a harbor entrance.

Keel
The permanently positioned, fore-and-aft backbone member of a boat's hull.

Knot
To bend a line. Also, a unit of speed equal to one nautical mile (6,076.10 feet) an hour.

Launch
(1) To put a vessel into the water;
(2) A small open powerboat, mainly used for transportation between a vessel and shore.

Lee
The side opposite to that from which the wind blows.

Leeward
Situated on the side turned away from the wind. (Opposite of windward.)

Leeway
The amount a boat is carried sideways by the wind's force or current.

Limber Holes
Drainage holes in the bilge timbers of a vessel, allowing to run to a low point for pumping out.

List
(1) A continuous leaning to one side, often caused by an imbalance in stowage or a leak into one compartment;
(2) A light list is a printed listing of aids to navigation, in geographical order or inclining of a vessel toward the side.

LOA
Length over all; the maximum length of a vessel's hull, excluding projecting spars or rudder.

Locker
A storage place, a closet.

Log
A record or diary of a vessel's journey.

Lubber's Line
A mark or permanent line on a compass that shows the course of the boat.

Making Way
Making progress through the water.

Marina
A place, essentially a dock area, where small recreational craft are kept; usually floats or piers, as well as service facilities, are available.

MAYDAY
A radio distress call, from the french m'aidez (help me); SOS in Morse Code.

Mooring
Commonly, the anchor chain, buoy, pennant, etc., by which a boat is permanently anchored in one location.

Motor
A source of mechanical power.

Motorboat
Any watercraft 65 feet or less in length propelled by machinery, whether or not such machinery is the principal source of propulsion.

Navigation
The art of conducting a ship from port to port.

Nautical Mile
6076.12 feet, or 1852 meters, an international standard; the geographical mile, the length of one minute of latitude at the equator, is 6087.20 feet.

Nun Buoy
A conical, red buoy bearing an even number and marking the starboard side of a channel from seaward.

Oar
A long, wooden instrument with a flat blade at one end, used for propelling a boat.

Outboard
(1) A propulsion unit for boats, attached at the transom; includes motor, drive-shaft, and propeller; fuel tank and battery may be integral or installed separately in the boat;
(2) Outside or away from a vessel's hull; opposite of inboard.

Outdrive
A propulsion system for boats, with an inboard motor operating an exterior drive, with driveshaft, gears, and propeller; also called stern-drive and inboard/outboard.

Overall Length
The extreme length of a vessel, excluding spars or rigging fittings. See LOA.

Painter
A rope attached to the bow of a boat for making it fast.

PFD
Personal Flotation Device.

Pier
A structure, usually wood or masonry, extending into the water, used as a landing place for boats and ships.

Pile
A vertical wooden or concrete pole, driven into the bottom; may be a support for a pier or floats; also used for mooring.

Piling
A structure of piles.

Pitch
(1) The up and down movement as the bow and stern rise and fall due to wave action;
(2) The theoretical distance advanced by a propeller in one revolution.

Planing Hull
Type of hull that is shaped to lift out of the water at high speed and ride on the surface.

Port
The left side of a boat when you are facing the bow, also a destination or harbor.

Privileged Vessel
Former term for the vessel with the right-of-way.

Propeller
Wheel or screw. Mechanism that pushes water aft to propel the boat.

Rigging
The general term for all lines(ropes) of a vessel.

Roll
The sideward motion of a boat caused by wind or waves.

Rules of the Road
The nautical traffic rules for preventing collisions on the water.

Scope
The length of the anchor rope or chain. 6 to 1 scope means that the length of the anchor rope from the boat to the anchor is 6 times the depth of the water.

Scupper
A hole allowing water to run off the deck.

Sea Anchor
A floating canvas cone, held open by wire rings, with an opening in the smaller end, and a rope bridle at the larger end attached to a line leading to the vessel; used in storm conditions to (a) keep the bow of the boat to the wind, and (b) slow downwind drift of the boat.

Sea Cock
A through-hull valve, a shut-off on a plumbing or drain pipe between the vessel's interior and the sea.

Slip
(1) A berth for a boat between two piers or floats;
(2) The percentage difference between the theoretical and the actual distance that a propeller advances when turning in water under load.

Sole
The cabin or cockpit floor.

Spar Buoy
A channel marker that looks like a tall, slender pole.

Stand-On Vessel
The vessel with the right-of-way.

Starboard
The right side of a boat when you are facing the bow.

Stern
The after end or back of the boat.

Stow
To store items neatly and securely.

Strake
Planks running fore and aft on the outside of a vessel.

Taffrail
The rail around a boat's stern.

Tide
The alternate rise and fall of waters caused by the gravitational attraction of moon or sun.

Topsides
(1) The sides of a vessel above the waterline;
(2) On deck as opposed to below deck.

Transom
The transverse planking which forms the afterend of a small, square-ended boat. (Outboard motors are usually attached to a transom.)

Trim
To arrange weights in a vessel in such a manner as to obtain desired draft at bow and stern.

Trimaran
Boat with three hulls, the center one is the largest.

Unbend
To cast-off or untie.

Underway
Vessel in motion, i.e., when not moored, at anchor or aground.

USPS
United States Power Squadron, a private membership organization that specializes in boating education and good boating practices.

Vessel
Every kind of watercraft, other than a seaplane on the water, capable of being used as a means of transportation on water.

VHF Radio
A Very High Frequency electronic communications and direction finding system.

Wake
Moving waves, created by vessel motion. Track or path that a boat leaves behind it, when moving across the water.

Wash
The loose or broken water left behind a vessel as it moves along; the surging action of waves.

Waterline
The intersection of a vessel's hull and the water's surface; the line separating the bottom paint and the topsides.

Way
Movement of a vessel through the water. Technically it is underway when not at anchor, aground, or made fast to the shore. The common usage is interpreted as progress through the water. Headway when going forward and Sternway when it is going backwards.

Well
Area at the rear of a boat where the motor may be located.

Wharf
A structure, parallel to the shore, for docking vessels.

Wheel
(1) The steering wheel;
(2) The propeller.

Whistle Signal
A standard communication signal between boats, to indicate change of course, danger, or other situations.

Windward
Situated on the side closest to the wind. (Opposite of leeward.)

Yaw
To swing or steer off course, as when running with a quartering sea.

Improper towing can result in personal injury and equipment damage. Familiarize yourself with proper towing procedures before taking your boat out on the road.

Improper trailering is a major cause of hull damage. Your boat's warranty does not cover this type of damage. Have your dealer assist you when selecting the appropriate trailer for your boat.

> ⚠ **WARNING**
>
> **The total weight of your loaded trailer must not exceed the capacity marker on the hitch of your tow vehicle. Overloading can cause hitch failure leading to injury-causing accidents.**

IMPORTANT: The published weight is the dry weight of your boat. Dry weight does not include the weights of outboard motors, batteries, gasoline, any optional items, gear or trailers. The weight of these items must be added to the dry weight to determine the proper trailer GVWR needed. On boats equipped with stern drive engines, the dry weight includes the weight of the standard engine. If your boat is equipped with a larger than standard engine, you must allow for this added weight.

GROSS VEHICLE WEIGHT RATING

If your boat does not come with a trailer package, selection of a trailer is extremely important. Your trailer should be able to accommodate the weight of the boat, engine, full fuel tank and any other equipment that will normally be carried. Check the certification label on the frame of the trailer for the Gross Vehicle Weight Rating (GVWR). The total weight of your boat, engine, fuel, gear and trailer should not exceed the GVWR.

IMPORTANT: The side supports should only be tight enough to keep the boat from leaning side to side. Any unnecessary pressure may damage the hull.

Always use bow and stern tie downs to prevent the boat from shifting. Do not put other gear in your boat while trailering.

WEIGHT DISTRIBUTION

If your towing vehicle is equipped with a weight distribution hitch, it must be capable of handling the GVWR. The weight on the trailer should be evenly distributed and can be checked by determining the tongue weight.

Tongue weight is a percentage of the total weight of the loaded trailer on its tongue. Ideal tongue weight is not less than five percent (5%) and not more than ten percent (10%) of the GVWR. For example, if the weight of the loaded trailer is 3000 pounds, the weight on the tongue should be more than 150 pounds, but less than 300 pounds. Excessive tongue weight will cause the front end of the towing vehicle to sway. Insufficient tongue weight will cause the trailer to sway or fishtail.

To avoid personal injury and property damage, be sure to balance the load when trailering. If too much weight rests on the hitch, the front end of the vehicle will sway or oversteer. Insufficient weight on the trailer will cause the trailer to fishtail. In either case, the vehicle will be hard to handle and could become uncontrollable at high speeds.

State regulations usually require that trailers above a specified weight rating be equipped with brakes. Requirements vary; check with your dealer for additional information.

> ⚠ **WARNING**
>
> **The total weight of the trailer, boat and gear must not exceed the GVWR of the trailer. Overloading can lead to injury, causing accidents.**

HITCH

Hitches are divided into classes that specify the gross trailer weight (GTW) and maximum tongue weight for each class. Always use a hitch with the same class number as the trailer. Most boat trailers connect to a ball hitch that is bolted or welded to the towing vehicle. Special heavy-duty equalizing hitches are necessary for trailer tongue weights of 350 pounds or greater.

The trailer hitch coupler must match the size of the hitch ball. The correct ball diameter is marked on the trailer coupler.

SAFETY CHAINS

Safety chains on your boat trailer provide added insurance that it will not become completely detached from the towing vehicle. Crisscross the chains under the trailer tongue (as shown on **Figure 13.1**) to prevent the tongue from dropping to the road if the trailer separates from the hitch ball. Be sure to leave some slack when attaching the chains; otherwise, the angle of the tongue in relation to the tow vehicle can cause the chains to become too tight when the tow vehicle is turning. Safety chain should be of the "Proof Coil" type and must have a minimum breaking strength equal to the upper limit of the GVWR. Some states require chains to be locked so they can't shake, bounce or vibrate off their hook.

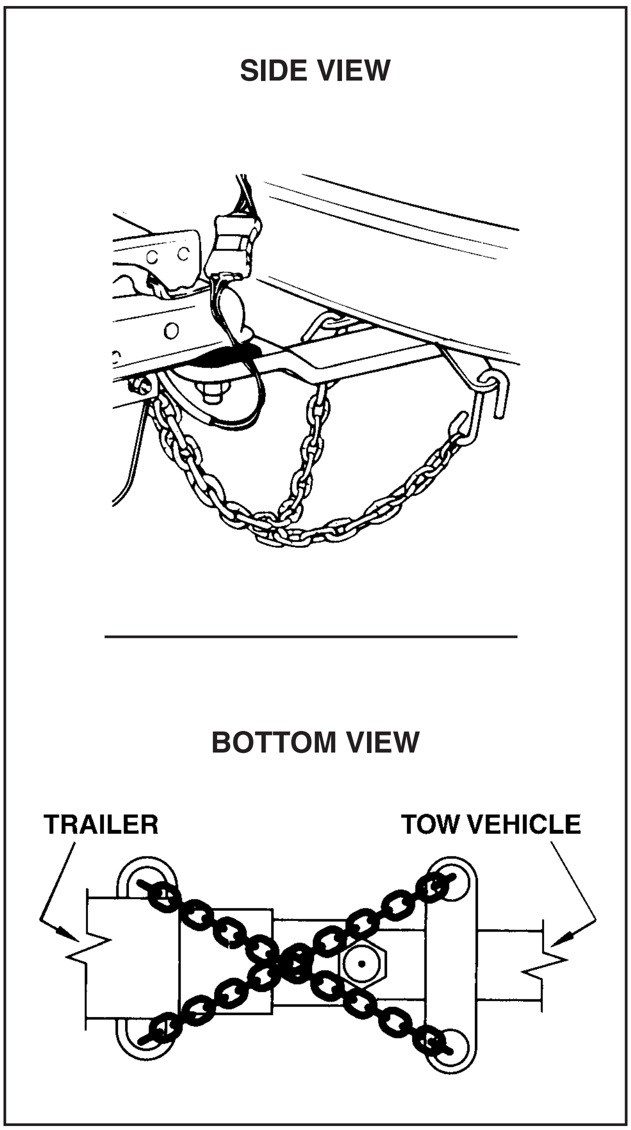


FIGURE 13.1 SAFETY CHAINS

TRAILERING GUIDELINES

1. Be sure that the rollers or bunks displace a large amount of hull surface and the boat and equipment distribute evenly on the trailer.

2. Make sure your boat is properly tied down and a safety chain is used.

3. Do not trailer with your boat's convertible top or its side and aft curtains up. They can be severely damaged.

4. Be sure your trailer is equipped with functional tail lights and turn signals as required by state and federal laws.

5. Check with your state Department of Motor Vehicles for registration and licensing regulations in your state. Some states require that boat trailers be registered and licensed.

6. Be aware that a turn for the trailer will be wider than a turn for the tow vehicle **(Figure 13.2)**. When making a turn, be careful that your trailer does not strike another vehicle or object.

7. Inspect your trailer regularly to make sure the side supports are in good working order. Check bolts which secure rollers and sup-

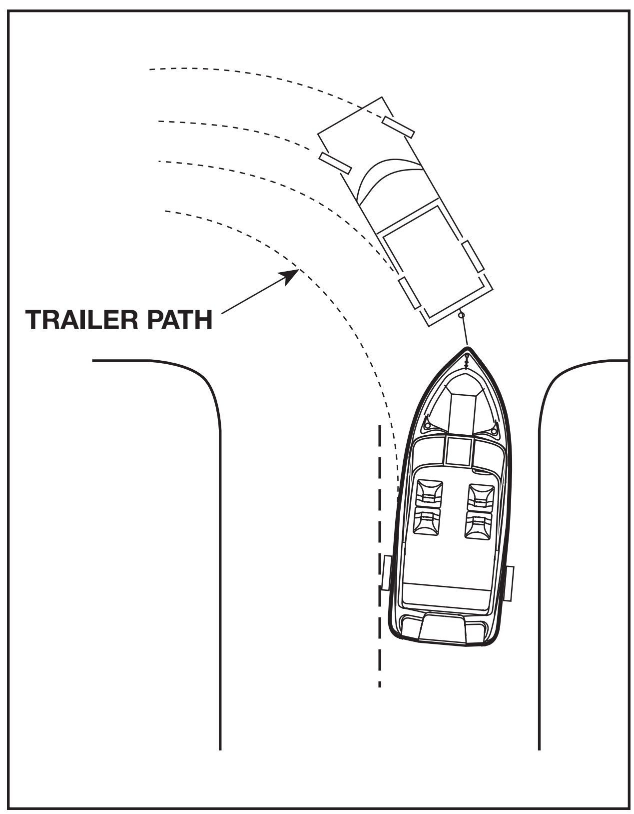


FIGURE 13.2 TRAILER PATH

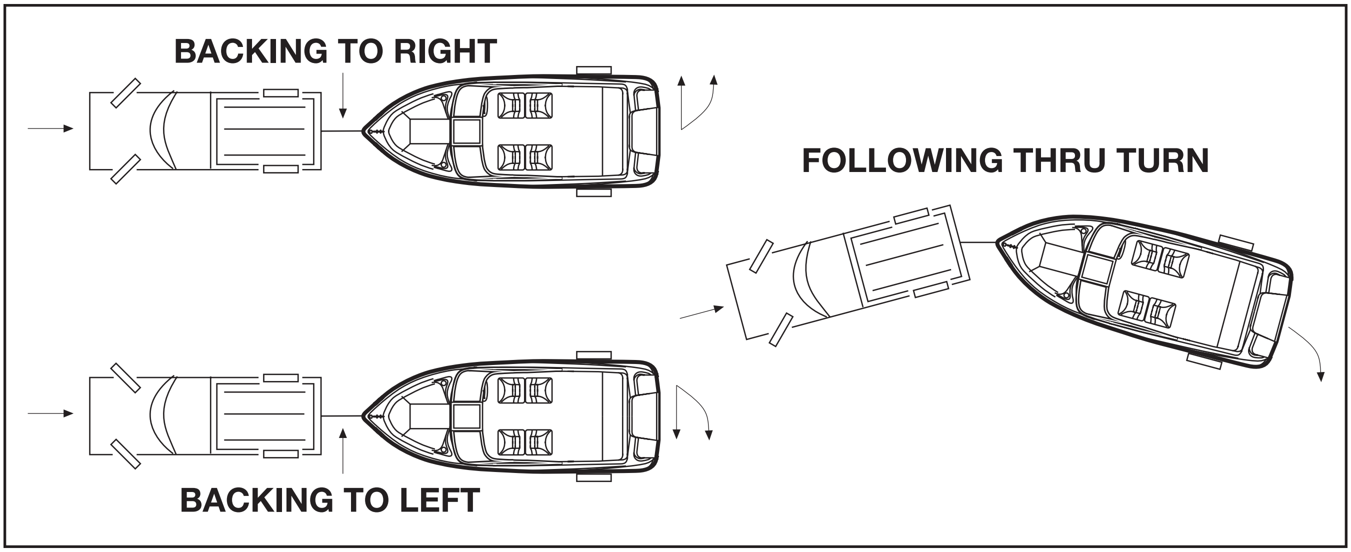


FIGURE 13.3 BACKING A TRAILER

ports for tightness. Check wheel bearings frequently for sufficient grease.

8. Check local and state laws for any additional requirements for trailers.

BACKING A TRAILER

Practice backing with a trailer before you get into a confined launch site. Get accustomed to using your trailer in an open area. Take someone with you who knows how to back a trailer.

Backing a trailer works the opposite of backing a car **(Figure 13.3)**. If the trailer needs to travel to the right, turn the steering wheel to the left and vice versa. Do not turn the wheel too far or oversteer. Turn the wheel gradually until you get the feel of safe backing.

If you do not have experience in backing up with a trailer, practice! Take your trailer to an open area and master using it before you and your boat get into a confined public or private launch site.

LAUNCHING GUIDELINES

Before launching your boat, stay to one side and watch a couple of launchings to notice any problems on the ramp and the effects of the wind and the current on launching. It s a common courtesy to prepare the boat for launching away from the ramp. This preparation includes:

1. Checking that the bilge drain plug is in place.
2. Removing any trailering tie-downs from the boat.
3. Attaching the docking lines and fenders.
4. Disconnecting the trailer lights from the car.

NOTE: If you have a bunk trailer, the boat's transom must be deeper than several inches in the water before launching.

Here are some tips to remember when putting your boat in the water:

1. Have an individual at the launch ramp give you directions. Back slowly down the ramp. If the trailer needs to be maneuvered to the right, turn the towing vehicle's steering wheel to the left. If trailer movement to the left is required, turn the steering wheel to the right. Always remember to launch your boat at a right angle to the shoreline.

2. Before backing your boat down the launch ramp:

   - Remove all stern tie-downs.
   - Properly secure all loose gear.
   - Inventory your safety equipment.
   - Load all personal gear.
   - Lock winch and trailer unit.
   - Disconnect trailer wiring from towing vehicle to prevent short circuits caused by submersion.

4. If launching from a trailer, tilt the stern drive or outboard motor up to the high tilt trailer position to avoid damage during the launch.

5. When the boat's transom is in several inches of water:

   - STOP the towing vehicle.

   - If you have a manual transmission, leave it in gear. If you have an automatic transmission, shift to PARK.

6. Turn off the engine and set the parking brake.

7. Place blocks behind the vehicle's back wheels.

8. Do not detach the winch cable from the bow eye until a mooring line has been secured to one of the boat s cleats. Attach one line to bow and one line to the stern to help control the boat. See the Mooring Lines information later in this section for suggested securing procedures.

9. Launch the boat; move it down and OFF the trailer into the water.

10. Secure boat to dock or have someone hold mooring lines.

11. Lower stern drive or outboard all the way into the water.

12. Pull your towing vehicle away from the launch ramp.

13. Park only in designated areas. When parking, be sure your towing vehicle and trailer do not block other boaters from approaching the launch ramp or hinder their ability to maneuver a boat and trailer when launching.

LOADING YOUR BOAT ON THE TRAILER

Follow these guidelines for loading your boat back onto the trailer.

1. Back the trailer into the water.

2. When the trailer is in several inches of water:

   - STOP the towing vehicle.

   - Leave manual transmission in gear or place automatic transmission in park.

   - Place blocks behind the vehicle's back wheels.

   - Turn off the engine.

   - Set the parking brake.

NOTE: If you have a bunk trailer, the trailer may need to be more than several inches in the water before loading.

3. Tilt the boat's drive up to the high tilt position to avoid damage while loading.

4. Pull boat up onto trailer and secure safety chain.

5. After securing the boat to the trailer start engine on towing vehicle and pull trailer out of water to boat securing area. (If blocks are connected with a rope to the trailer tongue, you will not need to remove them before pulling trailer out.)

6. Remove the drain plug and drain the bilge. Put drain plug in a conspicuous place for the next launch. Securing to steering wheel will help you remember to replace it.

7. Use tie-downs to secure boat on trailer.

8. Make sure stern drive is raised and secure.

9. Wipe hull down to prevent water spots and keep hull clean.

10. Make sure everything in the boat is secure or tied down. Place anything loose in towing vehicle.

11. Reconnect trailer lights. Check that lights are working.